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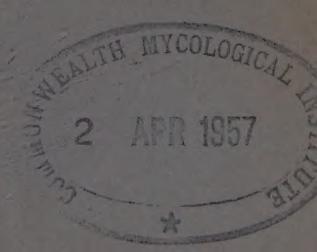
THE VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

SENZE, A. & SAMBORSKI, Z. (1956). Nitrogranulogen przy chronicznych nieżytach wymienia u krów. [Nitrogen mustard in the treatment of bovine chronic mastitis.]—*Méd. vét., Varsovie*. **12**, 551-553. [In Polish. English and Russian summaries.] **976**

Of 21 cows with chronic mastitis 13 were treated once daily with i/v injections of methyl chlorethyl amine (nitrogen mustard), 10-25 mg. in normal saline; the other 8 which were advanced cases, were given in addition intramammary injections of penicillin twice daily. Ten of the 13 cows showed complete recovery after 3-5 injections and 4 of the 8 responded to treatment within 4 days.—M. GITTER.

SPENCER, G. R., STEWART, J. H. & LASMANIS, J. (1956). Preliminary report on immunization of animals against *Micrococcus pyogenes*.—*Amer. J. vet. Res.* **17**, 594-598. [Authors' summary modified.] **977**

Vaccination of rabbits with preparations of *Staphylococcus pyogenes* culture disclosed a protective effect from a combination of toxoid and formol-killed organisms combined with an adjuvant (mineral oil or aluminium hydroxide). A commercial staphylococcus toxoid had similar protective effects for rabbits. Eight out of 9 cattle immunized with large doses of the killed culture-toxoid developed high titres of anti-haemolysins that persisted at least 14 weeks. The severity of mastitis in 16 quarters of vaccinated cows challenged with viable toxic cultures was less than the reaction in 5 quarters of unvaccinated cows. A chronic infection developed, after challenge, in 9 of the 16 quarters of the vaccinated cows.

In sheep similarly vaccinated, the titres were low and there was no evidence of protection against subsequent intramammary challenge.

COLLIER, J. R. (1956). Abscesses of the pharyngeal region of swine. Bacteriological examination of exudates.—*Amer. J. vet.*

Res. **17**, 640-642. [Author's summary modified.] **978**

A β -haemolytic *Streptococcus* species belonging to Lancefield's serological Group E was isolated from 421 of 492 samples of exudate from abscesses of the pharyngeal region of pigs. Of 11 other micro-organisms isolated and identified from the same material, the incidence ranged from 12.8 to 0.2%. The Group E *Streptococcus* is regularly associated with the exudate of this type of abscess in pigs and, on that basis, is worthy of consideration as the aetiological agent.

KÖNIG, A. (1956). Milzbrand-Epizootie in einer Schafherde. [Anthrax in a flock of sheep.]—*Dtsch. tierärztl. Wschr.* **63**, 473-474. **979**

An account of an outbreak in a flock in which 46% of the animals were affected. Most cases were apoplectiform without showing any characteristic symptoms. The lesions consisted essentially of haemorrhagic swelling of the spleen, but some animals had a haemorrhagic oedema of the subcutaneous tissues. The infection probably came from a pasture where anthrax carcasses had been buried many years before.—H. SCOTT McTAGGART.

ANON. (1956). [Aluminium hydroxide vaccine against anthrax.]—*Veterinariya, Moscow*. **33**, No. 11. pp. 95-96. [In Russian.] **980**

Because of complications following inoculation of "STI" anthrax vaccine [see *V.B.* **26**, 1490], the Ministry of Agriculture of the U.S.S.R. sought a new vaccine. An aluminium hydroxide vaccine was prepared at the State Institute for the Control of Veterinary Preparations from a strain of anthrax bacillus which was of low virulence for sheep (Strain 15). After satisfactory tests on lab. animals, 648,000 farm animals were inoculated in 1954. There were no complications, even in goats. In 1955 the vaccine was used in 666,000 cattle, 1,296,000 sheep,

96,000 horses, 57,000 pigs and 22,000 goats. Losses from vaccination were 0.0012% of cattle and 0.01% of sheep; there were no losses amongst horses, pigs or goats. A swelling developed at the site of injection, reaching a diameter of 2-3 cm. in sheep and 4-5 cm. in horses and cattle within 3-4 days. The vaccine was recommended for general use.—R.M.

ROTH, N. G., DEARMON, I. A., JR. & LIVELY, D. H. (1956). Survival time as a rapid method of determining virulence with *Bacillus anthracis*.—*J. Bact.* **72**, 666-672. [Authors' summary modified.]

981

Survival time of mice is suggested as a convenient and rapid method of determining virulence of *B. anthracis*. Significant differences were found in survival times of mice challenged with two strains at various dosages. Homogeneity of animals is important for precise determination of survival time. The median survival time for half the animals in a given treatment (ST_{50}) is proposed as the unit of measure. Two alternate methods for determining the ST_{50} are presented.

CARR, E. A., JR. & REW, R. R. (1956). Recovery of *Bacillus anthracis* from the nose and throat of apparently healthy workers.—*J. Lab. clin. Med.* **48**, 794.

982

Nose and throat swabs and pharyngeal washings were taken from 101 workers in two factories processing goat hair. *B. anthracis* was recovered from the nasal swabs of 7 workers and from the pharyngeal washings of 7 others.

—M.G.G.

LINDAU, A. (1956). On the value of tuberculin-negative herds in the detection of tuberculosis in human beings.—*Acta path. microbiol. scand.* Suppl. No. 111, pp. 179-180. Discussion: pp. 180-183. [In English.]

983

In Norway, Sweden and Denmark the cattle are now free from TB., but 169 human cases of bovine infection were found in 1941-54. L. emphasized the benefit to be obtained (1) in identifying human carriers by rechecking of herds and (2) from reporting human cases to the veterinary authorities.

In discussion on the paper it was reported that of 299 persons affected with bovine TB. in Jutland in 1943-52, 35% had re-infected cattle, 128 herds and 1,183 animals being infected.

—A. SEAMAN.

BERG, O. A. (1956). Tuberculosis in dogs.—*Acta tuberc. scand.* **32**, 351-361.

984

There were 8 cases of TB., mostly caused

by human type organisms, in 1,750 dogs examined at the Veterinary College of Norway during 1949-53. Case-histories were given.—R.M.

SVENKERUD, R. (1955). A study of heat concentrated synthetic medium tuberculin. Preparation, standardization and biological activity, pp. 349. Copenhagen: Munksgaard. Kr.25.00.

985

A full account, with reference to methods used at the Oslo Veterinary Institute. Particular attention was paid to biological assay in g. pigs and statistical evaluation of assay results. Relative merits of different tuberculins and different culture media were discussed.—R.M.

MAGNUS, K., GULD, J., WAALER, H. & MAGNUSSON, M. (1956). Instability of the potency of tuberculin dilutions. A second report.—*Amer. Rev. Tuberc.* **74**, 297-303.

986

Tuberculin from partially filled ampoules was consistently less potent than tuberculin from completely filled ampoules. This phenomenon, called the "volume effect", could not be prevented by using ampoules coated with silicone or by using containers of quartz or nylon. It was reduced, however, by the addition of gelatine, gum arabic, or Tween 80. Exclusion of air by adding liquid paraffin had no effect. The inclusion of glass fragments markedly increased the effect. It is therefore suggested that the phenomenon is due to adsorption to the surface of the container.—M.G.G.

THURSTON, J. R. & RHEINS, M. (1956). Serologic investigations of mycobacterial antigens. III. Direct detection of homologous antibodies by BCG extract antigens in serums of rabbits injected with BCG and challenged with *Mycobacterium bovis*.—*Amer. Rev. Tuberc.* **74**, 756-763. [French and Spanish summaries. Authors' summary copied verbatim.]

987

Erythrocyte-sensitizing antigens obtained by the aqueous extraction of bacillary masses of BCG can be used to detect directly homologous antibodies in rabbits immunized with BCG and challenged with a bovine strain of tubercle bacillus. The independence of the antibody measured with the BCG antigen from those detected with Old Tuberculin-sensitized erythrocytes was confirmed by inhibition and cross-adsorption tests.

DERIVAUX, J., SCHOENAERS, F. & BIENFET, V. (1956). Un cas généralisé de granulome de Röckl. Essai de transmission expérimentale. [Generalized Röckl's granuloma in a heifer.

Experimental transmission.] — *Ann. Méd. vét.* **100**, 16-23. **988**

P.M. examination of an 18-month-old heifer with numerous skin lesions revealed caseous TB. of the lungs and of the bronchial, broncho-mediastinal and hepatic lymph nodes. A suspension of the skin nodules was inj. s/c into 2 g. pigs and i/d into a calf. The g. pigs developed typical TB. P.M. examination of the calf 3 weeks later revealed nodules near the site of inoculation and acute miliary TB. of the lungs. Bovine type tubercle bacilli were recovered from the 3 experimental animals.—M.G.G.

MINAMI, K. (1956). Bactericidal action of oleic acid against *Mycobacterium avium*. — *Nature, Lond.* **178**, 743. **989**

The bactericidal effect was found to depend on the concentration of oleate and the time of contact, and the action was not reversed by washing the cells in distilled water. That the bactericidal action is concerned with the surface structures of the cells was confirmed by examination with the electron microscope: after treating the cells with oleate in a concentration of 1:100 for 60 min. some of their surface structures were disintegrated and their cytoplasmic contents were projected outside the cells.

—E.V.L.

CLAPP, K. H. (1956). Tuberculosis-like lesions in swine in South Australia. — *Aust. vet. J.* **32**, 110-113. **990**

Four hundred and twenty pig lymph nodes were examined bacteriologically to determine the relationship between gross lesions and the organisms responsible for them. From 149 nodes regarded as non-tuberculous, *M. tuberculosis* was isolated 12 times, *Corynebacterium equi* 37 times (on 6 occasions in association with *M. tuberculosis*). Of 271 nodes regarded as tuberculous, 137 yielded cultures of *M. tuberculosis*, and 27 yielded *C. equi*. Of a total of 167 strains of mycobacteria recovered, 6 were bovine tubercle bacilli, 18 were saprophytic mycobacteria, and the remainder were avian type tubercle bacilli.—R. D. BARRY.

DOYLE, T. M. (1956). Johne's disease. — *Vet. Rec.* **68**, 869-878. Discussion: pp. 878-886. [Author's summary copied *verbatim*.] **991**

Johne's disease of cattle and sheep is an international problem of great economic importance and urgency; and the evidence shows that it is being gradually introduced into new areas. It has recently been proved that a considerable percentage of foetuses from clinically affected cows are infected. It is now known that in addition to clinical infection at least 17% (prob-

ably more) of apparently normal cattle carry a latent infection. The only practical method at present available for the control of the disease in heavily infected herds is vaccination. But unfortunately the close relationship between *M. johnnei* and the bovine tubercle bacillus creates an obstacle to this procedure in countries engaged in the eradication of tuberculosis by tuberculin testing.

CHANDLER, R. L. (1956). A micro complement-fixation for Johne's disease and its application to diagnosis in sheep. — *Vet. Rec.* **68**, 819-825. **992**

In the micro-complement fixation test described, perspex trays with countersunk cells were used, and the antigen was the neutralized supernatant of a saline extract at pH 9.5 of autoclaved, dried, defatted, pulverized cultures of a bovine strain of *Mycobacterium johnnei* which had first been extracted with saline at pH 4. An antigen consisting of the neutralizing supernatant of an alkaline saline extract of viable washed organisms gave comparable results. In cattle and sheep in New Zealand, the test has been 80-84% effective in detecting suspected cases of Johne's disease and at least 77-80% efficient in showing suspects free from disease. In herds affected with Johne's disease and TB., it was preferable to the c.f. test described by Hole [*V.B.* **24**, 1777].—A. ACKROYD.

ŠTERK, V. & ŠEBETIĆ, Č. (1956). Osrv na pojavu enzootične bronhopneumonije ždrabadi. [Bronchopneumonia in foals in Yugoslavia associated with *Corynebact. equi*.] — *Vet. Arhiv.* **26**, 183-191. [In Croat. English and German summaries.] **993**

The authors described an outbreak of bronchopneumonia accompanied by respiratory catarrh and purulent abscesses in lungs and mediastinal lymph nodes in 60 of 66 foals aged 1-5 months. Four died. *Corynebact. equi* was isolated from four samples, *Pseudomonas putida*, unidentified micrococci and streptococci, and unidentified streptococci, from two samples each.—E.G.

CARNE, H. R., WICKHAM, N. & KATER, J. C. (1956). A toxic lipid from the surface of *Corynebacterium ovis*. — *Nature, Lond.* **178**, 701-702. **994**

A light extraction of live *C. ovis* with petrol ether removed a lipid without impairing the viability of the organism on ordinary culture media. This lipid extract was a wax-like substance which, when dissolved in liquid paraffin and injected i/d into g. pigs or rabbits, produced swelling, congestion and a central zone

of haemorrhagic necrosis. The reaction was not influenced by prior inoculation with large doses of antitoxin. Doses of the lipid up to 500 mg. injected i/p into g. pigs caused no general systemic toxic effects.—E.V.L.

DHANDA, M. R., CHANDRA SEKARIAH, P., LALL, J. M. & SETH, R. N. (1956). Occurrence of *Corynebacterium renale* in goats.—*Curr. Sci.* 25, p. 92.

C. renale was isolated from 2 of 50 goat urine samples and from the kidneys of 2 of 25 goats slaughtered at Mukteswar. Histologically the kidneys appeared normal.—E.G.

I. DE VRIES, J. & STRIKWERDA, R. (1956). Een geval van listeria-mastitis ("uier-listeriose") bij het rund. [Mastitis caused by *Erysipelothrix monocytogenes* in a cow.]—*Tijdschr. Diergeneesk.* 81, 833-838. [In Dutch. English, French and German summaries.] 996

II. DE VRIES, J. & STRIKWERDA, R. (1956). Ein Fall klinischer Euter-Listeriose beim Rind. [Mastitis caused by *Erysipelothrix monocytogenes* in a cow.]—*Zbl. Bakt. I.* 167, 229-232. [English, French and Russian summaries.] 997

I. & II. *Erysipelothrix (Listeria) monocytogenes* was isolated from the abnormal secretion and the mammary tissue of a quarter with chronic mastitis of 3 months' standing. It belonged to the serological Type 1 of Paterson [see *V.B.* 11, p. 745]. At slaughter no other lesions were found, apart from mastitis of the affected quarter and enlargement of the supra-mammary lymph nodes on the affected side. Histology of the mastitis was described. The case demonstrated the necessity of bacteriological examination when mastitis did not respond to the usual antibiotics.—R.M.

V. STUCKRAD, J. (1956). Zur Frage des Vorkommens von *Listeria monocytogenes* in Fleisch- und Organproben von Schlachttieren. [Occurrence of *Erysipelothrix (Listeria) monocytogenes* in meat and organ samples of slaughter animals.]—*Arch. Lebensmittelhyg.* 7, 246. 998

Suspected listeriosis was not confirmed by bacteriological examination of liver, spleen, kidney and muscle samples from 55 adult cattle, 25 calves, 15 pigs, 3 horses and 2 sheep.—E.G.

MURPHY, T. (1956). Post-vaccination shock in calves following use of pasteurella (pneumonia) vaccine.—*Irish vet. J.* 10, 179-185. 999

There was a high incidence of shock following inoculation of 5 or 10 ml. of a commercial vaccine in 127 calves, of which 15 died. Symptoms were those of acute anaphylactic shock, although in the vast majority of cases there was no history of previous injection of pasteurella or any other vaccine or serum. The prompt administration of anti-histamines gave satisfactory results.—E.V.L.

SMITH, H. WILLIAMS & CRABB, W. E. (1956). The typing of *Escherichia coli* by bacteriophage: its application in the study of the *E. coli* population of the intestinal tract of healthy calves and of calves suffering from white scours.—*J. gen. Microbiol.* 15, 556-574. [Authors' summary slightly modified.] 1000

The authors described a bacteriophage method of classifying strains of *E. coli* from the alimentary tract of cattle. It was possible to divide the strains into a large number of types. Varying proportions of strains isolated from the faeces of human beings, sheep, pigs and poultry were also typable by the phages employed. This method was used to study the origin and behaviour of the *E. coli* population in the alimentary tract of healthy cows and calves, and of calves with white scours, in a self-contained herd (Herd A) and to a lesser extent in 27 other herds. Several types of *E. coli* were often found in the same faecal specimen in cases of scouring, as well as in healthy calves. 70 different phage types were found in the faeces of the healthy calves in herd A, many occurring infrequently. 32 different types were discovered in the faeces of the scouring calves in this herd; only one strain of one type was found in scouring calves that was not found also in healthy calves. Two types were found commonly in the calves but rarely in the cows. The examination of strains of *E. coli* from faeces of cows and calves at daily and weekly intervals indicated that some types usually remained dominant for a week or so and were then gradually succeeded in dominance by others. In some animals frequent and sudden changes were apparent; in others one type might be the only type isolated from the faeces over a number of weeks. Changes of dominant phage-type commonly occurred in faeces of calves during the time they were suffering from white scours. The dam did not appear to be a frequent source from which a calf acquired its *E. coli*; the calf pens seemed a more probable source. Exceedingly large numbers of *E. coli* were found in the faeces of healthy and scouring calves during the first 14 days of life, a period when white scours occurs; very much smaller numbers were found in older

animals. Studies on material from the 27 other herds supported the findings in Herd A; many phage types of *E. coli* were found in these herds that had not been found in herd A. The aetiology of calf scours is discussed in the light of these and other observations.

I. MOLL, T. (1956). The susceptibility of weaned mice to *Escherichia coli* and *Salmonella typhimurium* endotoxins during, and subsequent to, cortisone treatment.—*Amer. J. vet. Res.* 17, 786-788. 1001

II. MOLL, T. (1956). The susceptibility of weaned mice to *Escherichia coli* during, and subsequent to, cortisone treatment.—*Ibid.* 795-798. [Author's summaries modified.] 1002

I. The resistance of weaned mice to the effects of *E. coli* and *S. typhi-murium* endotoxins was increased during administration of cortisone and markedly decreased after its abrupt withdrawal. M. discussed the practical significance of these results in relation to disease production.

II. Increased invasion of the bloodstream by bacteria from the alimentary and respiratory tracts was observed in mice during and after cortisone treatment. There was an inverse relationship between the incidence of invasion of the bloodstream from the lung and that of local inflammatory response in the lung. M. discussed the status of adrenal function as a determining factor for invasion by "potentially pathogenic bacteria".

FIEDLER, C. (1956). Über das Vorkommen von *Salmonella bareilly* bei Schlachtrindern. [*S. bareilly* in slaughter cattle.]—*Arch. Lebensmittelhyg.* 7, 245-246. 1003

S. bareilly was isolated in Schleswig-Holstein from one local and two imported Danish slaughter cows.—E.G.

SCHAAL, E. & SCHÜTZ, G. (1956). Über ein gehäuftes Vorkommen von *Salmonella orion* im Kot gesunder Schlachtschweine. [Multiple occurrence of *S. orion* in the faeces of healthy slaughter pigs.]—*Arch. Lebensmittelhyg.* 7, 244-245. 1004

S. orion was isolated from faeces of 6 of 37 apparently healthy slaughter pigs. Other salmonella organisms isolated were *S. montevideo*, *S. muenchen*, *S. binza*, *S. typhi-murium*, *S. newington*, *S. kentucky* and *S. oranienburg*. Imported fish and bone-meal was regarded as a likely source.—E.G.

HOBSON, D. (1956). The chemotherapy of experimental mouse typhoid with furazolidone.—*Brit. J. exp. Path.* 37, 20-31. 1005

Large doses of furazolidone (100 mg./kg. body weight daily for 10 days) usually eradicated *Salmonella typhi-murium* from mice when treatment began 24 hours after i/p infection. Smaller doses and treatment beginning later after infection reduced mortality, but most of the survivors were carriers. These carriers showed little tendency to relapse when treatment stopped. All organisms isolated from carriers were sensitive to furazolidone. The drug was toxic for mice in daily doses of 300 mg./kg.

—M.G.G.

GERRIETS, E. (1956). Vergleichende Therapieversuche mit Sulfamerazin und Sulfathiazol bei experimenteller *S. pullorum*-Infektion von Küken. [Comparison of sulphamerazine and sulphathiazole in the treatment of experimental *S. pullorum* infection in chicks.]—*Dtsch. tierärztl. Wschr.* 63, 483-486. 1006

G. tested the therapeutic value of sulphamerazine and sulphathiazole in 4 groups of 100 chicks each. Group I were controls. Groups II-IV were infected when 24 hours old by inj. into the crop of 0.5 ml. of *S. pullorum* culture. Groups III and IV were given sulphamerazine and sulphathiazole, 0.5% of the feed, from the second to the sixth day after infection. There were no deaths in Group I. The death rate in Group II was 73 within 4 weeks. 61 of the group given sulphamerazine and 71 of the group treated with sulphathiazole died. The substantial mortality rate was ascribed to the high virulence of the test strains.

S. pullorum was demonstrated in survivors of groups II-IV when examined serologically and culturally at the age of 20 weeks. When again examined at the age of 35 weeks *S. pullorum* was demonstrated in chicks of Group II only.—E.G.

GORET, P., JOUBERT, L. & OUDAR, J. (1956). Invalidité de la distinction entre *Salmonella gallinarum* et *Salmonella pullorum* et de leurs "variétés" biochimiques entre elles. [Invalidity of the distinction between *Salmonella gallinarum* and *S. pullorum*.]—*Ann. Inst. Pasteur.* 91, 31-49. [English summary]. 1007

Strains isolated from 48 outbreaks of fowl typhoid were grouped provisionally into *S. gallinarum* and *S. pullorum* on the basis of dulcite fermentation. There was no correlation between this grouping and the area where the outbreak occurred or the age of the host. 60% of the chicks were infected by "pullorum" and

65% of the adults by "gallinarum", the infection tending to be chronic in the adult and acute in the young. The "pullorum" strains could be divided into 8 groups by their sugar fermentation reactions and the "gallinarum" strains into 7 groups, but only 9 of the 48 strains corresponded to Kauffmann's differentiation between *S. gallinarum* and *S. pullorum*. Serologically the 48 strains were uniform. The few specific phages obtained did not aid classification, nor did antibiotic sensitivity tests.

—A. SEAMAN.

SAVAGE, W. (1956). Problems of salmonella food-poisoning.—*Brit. med. J.* Aug. 11th. 317-323. **1008**

The incidence of salmonella food-poisoning in Gt. Britain is increasing. *Salmonella* infections in animals appear to be more widespread. There has been a rise in the number of symptomless persons excreting *Salmonella*. Meat and egg products are the chief sources of infection. The hazards of food-poisoning are increased by the population's changing eating habits, whereby more meals are eaten away from the home and more use is made of foods prepared commercially on a large scale.—M.G.G.

KRALJ, M., BRUDNJA, Z., RIŽNAR, S. & HAJSIG, M. (1956). O brucelozi goveda u seljačkim domaćinstvima. [Incidence of brucellosis in cattle on Yugoslav farms.]—*Vet. Arhiv.* **26**, 209-217. [In Croat. English and German summaries.] **1009**

During an investigation into the incidence of brucellosis in the Zagreb district, 0.66% of 1,731 cows and heifers yielded positive and 0.07% doubtful reactions to the ring test. The tube agglutination test gave 0.06% positive and 0.37% doubtful reactions. Negative reactions obtained by both tests agreed, however, in nearly 99%. Bacteriological examination of milk and g. pig inoculation were carried out in some animals in addition to the above tests.

—E.G.

SCHAAL, E. (1956). Die Brucellose-Verseuchung der Schlachtrinder am Schlachthof Duisburg und ihre Bedeutung vom Standpunkt der Fleischhygiene. [Brucellosis in slaughtered cattle at Duisburg and its importance for meat hygiene.]—*Dtsch. tierärztl. Wschr.* **63**, 500-502. **1010**

About 20% of 1,600 cows examined at the Duisburg abattoir for brucellosis yielded positive agglutination titres of 1:50 and higher, and 12% yielded titres of 1:25, which were con-

sidered doubtful. The whey agglutination test was positive in 19%. The public health implications of these findings were discussed.—E.G.

PERREAU, P. (1956). La brucellose bovine au Tchad. [Bovine brucellosis in French West Africa.]—*Rev. Elev.* **9**, 247-250. [English and Spanish summaries.] **1011**

Nearly 2,000 agglutination and 1,000 milk ring tests were made. The average incidence of infection was 12%, the region of Lake Chad having the highest incidence (24%). Variation was great, ranging from 40 to 4% in contiguous villages. While brucella abortion undoubtedly occurs, it is not on the same scale as the infection rate.—A. SEAMAN.

BÜRKI, F., MARGADANT, C. & MOSIMANN, W. (1955). Diagnose der Rinderbrucellose durch einen Kutantest mit einem Polysaccharid-Allergen aus *Brucella abortus* I. Mitteilung: Bestimmung der Gebrauchsdosierung. [Diagnosis of bovine brucellosis by an intradermal test using a polysaccharide antigen from *Br. abortus*. I. Determination of the dosage.]—*Schweiz. Z. allg. Path.* **18**, 1147-1156. **1012**

Intradermal tests were carried out on cattle, using the polysaccharide antigen described by Mosimann [V.B. **22**, 343]. For each test 0.75 mg. of antigen dissolved in 0.2 ml. water was injected. Seven cattle known to be infected all gave positive results. 11 cattle known to be uninfected gave negative results, except for one which gave a doubtful result.—R.M.

I. WIEST, H. (1956). Untersuchungen über die Anwendbarkeit und die Sicherheit der Abortus-Bang-Ringprobe mit Blutserum als diagnostisches Untersuchungsverfahren bei der Brucellose des Rindes, verglichen mit der Blutserum-Langsamagglutination und der Meinicke-Reaktion. [Comparison of the serum ring test with the slow agglutination reaction and the flocculation reaction for the diagnosis of bovine brucellosis.]—*Inaug. Diss., Munich.* pp. 43. **1013**

II. BRÖMEL, G. (1956). Vergleichende Untersuchungen der Serum-Schnellagglutination und der Abortus-Bang-Ringprobe bei der Blutuntersuchung von Rindern auf Abortus Bang. [Comparative study of the rapid agglutination test and the serum ring test for the diagnosis of bovine brucellosis.]—*Inaug. Diss., Munich.* pp. 36. **1014**

I. From examination of 6,268 blood samples by the serum ring test, the tube agglutination reaction and the flocculation test described by Meinicke, it was concluded that for

practical diagnosis of bovine brucellosis the serum ring test was inferior to the other two tests.

II. B. stated that in practice the serum ring test was not a substitute for the rapid plate agglutination test.—E.G.

ANON. (1956). The value of the milk ring test (M.R.T.) and related tests in the detection of *Brucella* organisms in milk supplies.—

Mon. Bull. Minist. Hlth Lab. Serv. **15**, 85-95. [Abst. from summary.] **1015**

Sole reliance cannot be placed on any of the milk agglutination tests for the detection of *Br. abortus* in milk samples. In 60-75% of samples reacting positively, *Br. abortus* cannot be demonstrated by g. pig inoculation. Milk agglutination tests are of most value as herd tests and, in the laboratory, for screening.

In a comparison of the milk ring test with the whey agglutination, milk plate and capillary tube tests for the detection of *Br. abortus* in herd milk submitted for biological examination (the results being confirmed by g. pig inoculation), the ring test gave the lowest proportion of false negative reactions. When the ring test is used for screening, doubtful (\pm) reactions should be classified as positive rather than as negative. An incubation time of 60 min. is preferable to the original 30 min.; the longer incubation increases the sensitivity of the test as judged by g. pig inoculation. It can be applied as a screening test for the selection of herd samples suitable for double inoculation into g. pigs. For this purpose all samples giving a positive or doubtful reaction should be inoculated into separate g. pigs; two samples, however, giving a negative result may be injected into one g. pig. By this means a substantial saving in g. pigs is effected.

SEELEMANN, M. (1956). Praktische Probleme der Brucellosebekämpfung. [Problems in brucellosis control. I & II.]—*Berl. Münch. tierärztl. Wschr.* **69**, 379-382 & 393-397. **1016**

Ten cattle, vaccinated as calves with Strain 19, were slaughtered after reacting persistently to the serum agglutination test for brucellosis. G. pig inoculation and cultures of various body materials were negative. This confirms the findings of Morse *et al.* [V.B. **25**, 601]. Virulent *Br. abortus* was demonstrated in placentas from 6 out of 100 normal parturitions. Five of the cows had been vaccinated as calves. All 6 animals were negative to blood tests.

S. recommended the vaccination of calves with Strain 19. Two doses, each of 15,000 million organisms, should be given with an

interval of about 4 weeks between injections. He expressed the hope that with standardized methods of diagnosis and vaccination the German Federal Republic would be freed from bovine brucellosis within the next 5-6 years.

—M.G.G.

HUNTER, C. A. & COLBERT, B. (1956). Flocculation tests for brucellosis.—*J. Immunol.* **77**, 232-241. **1017**

Details were given of the preparation of a specific antigenic cholesterol-lecithin extract of smooth *Br. abortus* culture for use in microscopic and tube flocculation tests, the respective procedures, including standardization of antigenic suspensions, being described in detail. The tests were stated to be quick, accurate and easily read. Heating of the serum for 30 min. at 56°C. reduced the prozone phenomenon and titres without, however, affecting the diagnostic value of the tests.—E.G.

BICK, H., HALBERG, F. & SPINK, W. W. (1956). Investigations on polyvinylpyrrolidone in mice given brucella endotoxin.—*Proc. Soc. exp. Biol., N. Y.* **93**, 7-10. **1018**

The effect of polyvinylpyrrolidone on survival after i/v injection with brucella endotoxin was evaluated in two genetically different batches of mice. The drug was usually given simultaneously with the endotoxin. Mortality was reduced in one batch of mice but not in the other.—M.G.G.

ZELENKA, P. (1956). Prilog poznavanju raširenosti svinske bruceloze. [Brucellosis in boars.]—*Vet. Glasm.* **10**, 669-673. [In Croat. German summary.] **1019**

Br. suis was isolated from the urine of one and the testicles of another of two boars with orchitis. Specific agglutinins were present in the serum of other pigs of the same piggery. Details were given of serological and bacteriological findings in a third boar from a different farm.—E.G.

LOWBEER, L. (1956). The pathology of *Brucella suis* osteomyelitis.—*Amer. J. Path.* **32**, 660-661. **1020**

Osteomyelitis in *Br. suis* infection in a human being was characterized by the presence of granulomatous foci, with extensive central caseous necrosis, and surrounded by fibrous capsules. There was simultaneous destruction and repair of bone around the lesions, which were chronic.—R.M.

MORRIS, E. J. (1956). A selective medium for *Brucella* spp.—*J. gen. Microbiol.* **15**, 629-631. [Author's summary modified.] **1021**

Brucella organisms grew quantitatively within 65 hours of incubation on a selective medium containing 5-nitrofurfurylmethyl ether, bacitracin, polymyxin and Actidione, while organisms normally occurring in culture from faeces or soil were suppressed.

KIRIS, N. D. (1956). [Filtrable forms of brucella.]—*J. Microbiol., Moscow.* 27, No. 10, pp. 75-79. [In Russian.] **1022**

K. claimed that filtrable forms of the three species of *Brucella* were sometimes obtained by passing broth cultures of the organisms through Seitz filters. Secondary cultures from filtrates did not produce, or produced very little, H_2S and their agglutination titres were very low or absent.—R.M.

AIRAPETYAN, V. G. & KHACHATRYAN, A. B. (1956). [Diagnosis of tularemia in sheep during life.]—*Veterinariya, Moscow.* 33, No. 11, pp. 34-38. [In Russian.] **1023**

A preliminary survey of 1,500 sheep indicated that the agglutination and intradermal allergic tests employed in man were unreliable in sheep. Therefore agglutinin formation, and reactions to other tests, were studied in 15 sheep, infected with 10^8 - 50^8 virulent organisms. The course of experimental infection was less severe than that occurring naturally, and was not fatal. It was concluded that an agglutination titre of 1:200 or higher was diagnostic; the allergic and c.f. tests were unreliable.—R.M.

MATHEY, W. J., JR. (1956). A diphtheroid stomatitis of chickens apparently due to a spirillum, *Spirillum pulli*, species nova.—*Amer. J. vet. Res.* 17, 742-746. **1024**

M. reported a disease of adult fowls characterized by diphtheritic lesions of the buccal mucous membrane. A spirillum (apparently a new species, which it was proposed to name *Spirillum pulli n. sp.*) was demonstrable by dark-field microscopy in wet smears of scrapings from mouth lesions, but attempts to culture it were unsuccessful. The lesions were, however, reproduced in six-week-old chickens by inoculation into the buccal mucosa of a saline suspension of scrapings from lesions of affected fowls. The disease was also transmissible by contact.—F.E.W.

BRUDNJAK, Z., ZELENKA, P. & ŠIBALIN, M. (1956). Prilog poznavanju leptospiroze konja. [Diagnosis of leptospirosis in horses]—*Vet. Arhiv.* 26, 165-173. [In Croat. English and German summaries.] **1025**

Clinical symptoms of *L. pomona* infection in 16 horses were described.—E.G.

PLACERIANO, S. (1956). Prilog kliničkoj sliči leptospiroze konja. [Clinical picture of leptospirosis in horses.]—*Vet. Glasn.* 10, 594-598. [In Croat. German summary.] **1026**

The symptoms of *L. pomona* infection in five horses included fever, photophobia, somnolence, icteric conjunctivae, and episcleral vascular injection. In two, eye lesions resembled acute periodic ophthalmia. Diagnosis was confirmed by agglutination-lysis and in one horse also by isolation of *L. pomona* from the blood. Penicillin had no marked effect but appeared to shorten the convalescence. All horses recovered.—E.G.

BROWN, A. L., CREAMER, A. A. & SCHEIDY, S. F. (1956). Immunization of horses against leptospirosis by vaccination.—*Vet. Med.* 51, 556-558. **1027**

A group of 7 horses and another of 8 were inoculated s/c with 5 ml. and 10 ml. respectively of *L. pomona* killed culture vaccine. All developed antibody titres within a week which gradually declined over a period of 6 months. The 10 ml. dose elicited a higher and more persistent titre than did the 5 ml. dose.—M.G.G.

SALEI, P. I. (1955). [Improved method of specific prophylaxis in bovine leptospirosis.]—*Trud. voronezh. oblast. Nauchno-issled. Vet. opit. Stants.* No. 4, pp. 115-122. [In Russian.] **1028**

Instead of receiving two inoculations of quinosol leptospira vaccine, 32,338 cattle were each given a single s/c inj. of 5-10 ml. Subsequently 25 of them developed leptospirosis and 11 of them died. Protection lasted for about 9 months. Before vaccination, 495 out of 2,016 cattle had died from leptospirosis. There was no fall in milk yield after vaccination, but the vaccine was dangerous for calves less than 6 months old, which frequently developed leptospirosis as a result of inoculation.—R.M.

FENNESTAD, K. L. & BORG-PETERSEN, C. (1956). On the relation between bovine leptospirosis and abortion in Denmark.—*Acta path. microbiol. scand. Suppl.* No. 111, pp. 188-189. [In English.] **1029**

Sera from 461 brucellosis-negative aborting cows were tested for antibodies against 16 serotypes of *Leptospira*: 15 animals, having a titre of 1:300 or greater, were considered to be infected. A comparison of 212 sera from non-aborting and 130 sera from aborting cows revealed no difference in the proportions of reactors.—A. SEAMAN.

BORG-PETERSEN, C. & FENNESTAD, K. L. (1956). Studies on bovine leptospirosis and abortion. I. Serological examination of aborting and "normal" cattle in Denmark.—*Nord. VetMed.* **8**, 465-480. [In English. French and German summaries.] **1030**

In Denmark, although no clinical cases of leptospirosis have yet been reported, examination of the serum of 212 normal and 491 aborting cattle against 16 different serotypes of leptospira showed that 7-8% of both the normal and aborting cattle had antibody titres of 1:100 or more, and 24-29% had titres of 1:30 or more against one or more of the serotypes. Antibody responses in experimentally infected heifers indicated that about 1% of the abortions mentioned above may have occurred about a week after the onset of a leptospiral infection.

—A. ACKROYD.

FENNESTAD, K. L. & BORG-PETERSEN, C. (1956). Studies on bovine leptospirosis and abortion. III. Attempts to demonstrate *Leptospira* in cotyledons from aborting cattle.] —*Nord. VetMed.* **8**, 882-886. [In English. German and Danish summaries. Authors' summary modified.] **1031**

Leptospira could not be demonstrated by microscopy or g. pig inoculation in cotyledons from 12 abortions in cattle with agglutinin-lysin titres of 300 or greater against *L. saxkoebing*, *L. poi* or *L. ballum*. *Erysipelothrix* [*Listeria*] *monocytogenes* was demonstrated in the cotyledons from one case.

HAKIOGLU, F. (1956). Zum erstenmal durch histologische Untersuchung festgestellte Ziegen- und Schaf-leptospirosis in der Türkei. [Leptospirosis histologically confirmed in sheep and goats in Turkey.] —*Zbl. allg. Path. path. Anat.* **95**, 525-527. **1032**

Leptospires were identified in sections of kidney from 3 sheep and a goat with jaundice and haemoglobinuria. Serological tests were not carried out. The disease also occurred amongst cattle in the same districts.—R.M.

HOWARTH, J. A. (1956). A macroscopic tube-agglutination test for leptospirosis.—*Amer. J. vet. Res.* **17**, 789-792. [Author's summary modified.] **1033**

H. gave details for the preparation of antigens for use in the routine diagnosis of leptospirosis. *L. pomona*, *L. canicola* and *L. ictero-haemorrhagiae* organisms were propagated in culture medium and formalized when maximum growth had been obtained. For the test, tenfold dilutions of the serum in saline were mixed with the appropriate antigens and incubated. A

grossly visible floccule in the bottom of the cone-shaped tubes denoted a positive reaction. An evaluation of the agglutination test was made by routine testing of 7,313 serum samples over a 5-year period. Most of the herds with leptospira-positive sera presented the typical clinical picture of leptospirosis. Pigs, calves and rabbits inoculated with leptospira developed agglutination titres specific for the infecting organism. The test was highly specific: sera containing antibodies to various other bovine, porcine, and canine diseases failed to agglutinate leptospiral antigens. It compared favourably with the classical agglutination-lysis test.

ROTHSTEIN, N. & HIATT, C. W. (1956). Studies of the immunochemistry of leptospires.—*J. Immunol.* **77**, 257-265. [Authors' summary slightly modified.] **1034**

Extraction of leptospiral cells with 70% ethanol yielded a product which could be subdivided into two portions on the basis of solubility in distilled water. The soluble portion contained two antigenic components as evidenced by its ability to invoke both genus-specific precipitins and type-specific agglutinins in the rabbit. The agglutinins could be removed from antiserum by absorption with homologous organisms. On the basis of these observations, it was postulated that leptospires contain two major antigenic components: a P antigen, which is a peripheral, type-specific principle, and an S antigen which is a somatic, genus-specific principle. The S antigen appears to be a lipopolysaccharide; the chemical nature of the P antigen remains undefined.

KMETY, E., PLEŠKO, I. & CHYLO, E. (1956). Weitere Ergebnisse der Leptospiroforschung in der Slowakei. [Further results of leptospirosis research in Slovakia.] —*Zbl. Bakt. I. Orig.* **167**, 243-253. [English, French and Russian summaries.] **1035**

In recent years there has been a marked increase in the number of *Leptospira* infections transmitted to human beings from pigs. In 1955 there were 24 such cases, caused by 7 species of *Leptospira*. In one pig abattoir almost half of the employees whose sera were tested were positive. In a study of 460 healthy slaughter pigs, *L. pomona* and *L. mitis* were each isolated 21 times, *L. canicola* 3 times, *L. sejroe* 4 times and *L. ballum* once. The sera of 158 of the pigs (34%) were positive.—M.G.G.

MCCLUNG, L. S. (1956). The anaerobic bacteria with special reference to the genus *Clostridium*. In Annual Review of Microbiology

Vol. 10, pp. 173-192. [Palo Alto, California: Annual Reviews, Inc.] **1036**

M. reviewed the literature on the cultural and biochemical properties of clostridia in general, with special reference to those causing gas gangrene in human beings.—R.M.

LEV, M., BRIGGS, C. A. E. & COATES, M. E. (1956). Bacteriological studies of 'infected' and 'uninfected' chicks in relation to antibiotic growth stimulation.—*Nature, Lond.* **178**, 1125-1126. **1037**

In an investigation of a hypothetical infective growth-depressing condition in chicks [see *V.B.* **22**, 3559], the authors found spores of *Clostridium welchii* Type A in the caeca of chicks from infected premises 1-2 days after feeding, but not in the caeca of chicks from a clean environment. Chicks with *Cl. welchii* in their caeca weighed less than controls given penicillin. *Cl. welchii* was found in the caeca of only one batch of chicks given penicillin, and the production of lecithinase (α -toxin) by these strains was low.—M.G.G.

BOYD, H. (1956). Observations on bovine genital vibriosis.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 11-14. [French summary.] **1038**

Results were given of regular vaginal mucus agglutination tests in an infected dairy herd in Denmark, together with details from breeding records. Prophylactic measures were discussed.—E.G.

ADLER, H. C. (1956). Testing for *Vibrio fetus* infection of Danish A.I. bulls.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 5-7. [French summary.] **1039**

The author discussed measures for the control of *V. fetus* infection in cattle in Denmark, where about 20% of the bulls kept in 90 artificial insemination centres were infected. The fact that 60% of infected bulls had not been used for natural service was taken as evidence that direct transmission from bull to bull was possible. Control measures included examination at regular intervals of all bulls kept at centres, testing of those newly acquired, and disposal of infected ones.—E.G.

MORGAN, W. J. BRINLEY. (1956). The diagnosis of vibriosis in bulls.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 20-23. [French summary.] **1040**

Vibrios were isolated from preputial washings of 20, and semen samples of 10 of 26 bulls. Of the strains isolated 18 were catalase-negative and produced H_2S . Test mating of 37

bulls revealed 13 carriers. Vibrios isolated from these bulls were catalase-positive and did not produce H_2S . Catalase-positive vibrios were isolated from three test heifers following service. The bulls, however, proved to be free from infection in a subsequent test mating. Attempts to use g. pigs for diagnosis, failed.—E.G.

FLORENT, A. & VANDEPLASSCHE, M. (1956). Valeur comparée de la génisse d'épreuve, et de la culture sur milieu sélectif du liquide préputial, pour la confirmation de l'infection à *Vibrio fetus* du taureau. [Test-mating and culture of preputial washings as means of diagnosis of *Vibrio fetus* infection in bulls.]—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 15-17. [In French. English summary.] **1041**

Isolation of *V. fetus* from preputial washings, using a selective medium containing brilliant green, was found to be a quick and cheap method of diagnosis and therefore preferable to test-mating.—E.G.

BLOM, E. (1956). A five-year field experiment for controlling the occurrence of *Vibrio fetus* reactors using a modified tampon-test in the cow population of the Danish island of Møn. (Preliminary report).—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 7-10. [French summary.] **1042**

An account in English of work already published in Danish [see *V.B.* **27**, 708].—E.G.

HUNTER, W. K. (1956). A survey of herd fertility.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 27-29. [French summary.] **1043**

H. gave data concerning examination of 3,468 cows and heifers of 113 herds in six northern counties of England. Based on results obtained by mucus agglutination tests with 2,563 swab samples of which 13.7% were positive, *V. fetus* infection was diagnosed in 15 herds. A further 8 herds were suspected to be infected. Incidence of positive mucus agglutination tests in herds in which vibriosis was not detectable clinically, varied from 1-29.6%. It is stated that unless reactors number at least 30-40% and there is also supporting clinical evidence of infection, the value of mucus agglutination for diagnosis of pathogenic vibriosis is doubtful.—E.G.

FRANK, A. H., BRYNER, J. H. & CARUTHERS, B. (1956). The pathogenicity of *Vibrio* found in the reproductive tracts of cattle.—*Proc. IIIrd Int. Congr. Anim. Reprod.*

Cambridge, 1956. Sect. II. pp. 18-20.
[French summary.] **1044**

The authors studied the pathogenicity of catalase-negative and catalase-positive strains of *V. fetus*, isolated from vaginal mucus, semen and preputial samples. Catalase-negative *V. fetus* was frequently isolated from unbred bulls, but not from virgin heifers. Transmission by coitus from naturally infected bulls to heifers was rare. Catalase-positive *V. fetus* was not isolated from unbred bulls and virgin heifers. It was freely transmissible from bulls to heifers and *vice versa*. Infection with both types simultaneously was possible.—E.G.

RISTIC, M., HERZBERG, M. & SANDERS, D. A. (1956). Colonial and antigenic variations of *Vibrio fetus*.—*Amer. J. vet. Res.* 17, 803-809. [Authors' summary modified.] **1045**

Examination of stock cultures of *V. fetus* of bovine, ovine, and human origin, using oblique, indirect transmitted light, revealed one smooth and four distinctive non-smooth types of colony with correlated cell morphology. The non-smooth types were agglutinated with normal cattle serum in dilutions of 1:40 and 1:160 and with neutral acriflavine in dilutions of 1:800 to 1:6,400. The smooth type required CO_2 for growth, while the other types grew equally well without it. Uptake of 1:1,000 crystal violet occurred with very rough types; these had low motility and negligible catalase activity. Smooth types were strain-specific in cross-agglutination reactions, while with rough variants cross reaction occurred between homologous and heterologous strains.

MUNDT, W. (1956). Vorkommen von *Vibrio foetus* im infizierten weiblichen und männlichen Rindergenitale und seine Abgrenzung gegen die Darmvibriosis des Rindes. [Differentiation of genital and intestinal vibriosis in cattle.]—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 23-26. [In German. English and French summaries.] **1046**

Details are given of morphological, biochemical and cultural differentiation of *V. bubulus*, *V. jejuni*, *V. fetus* and of *Spirillum suis* from the porcine intestine.—E.G.

AMELL, V. H. & STOCKTON, J. J. (1956). Serological responses of cattle to *Vibrio fetus* vaccine as measured by the complement-fixation test and tube-agglutination test.—*Amer. J. vet. Res.* 17, 626-629. [Authors' summary modified.] **1047**

Ten heifers, about 8 to 17 months old, were inoculated with a formolized *V. fetus* vac-

cine (50×10^9 organisms/ml.). Three subcutaneous injections in the cervical region were made, (1 ml. followed in four weeks by 2 ml. and six weeks later another dose of 2 ml.). Blood samples were collected periodically from all animals for about 9 months after the initial inoculation. Serum titres for *V. fetus* antibodies, determined by means of the complement-fixation and tube agglutination tests, indicated a marked response during a 10-day period after each inoculation, with higher titres after each successive inoculation. Titres were transitory and generally declined after the tenth postinoculation day.

Any protection afforded the test animals and the significance, if any, of the serological responses have yet to be determined.

FIREHAMMER, B. D., MARSH, H. & TUNNICLIFF, E. A. (1956). The role of the ram in vibriosis of sheep.—*Amer. J. vet. Res.* 17, 573-581. [Authors' summary modified.] **1048**

In two natural outbreaks of vibriosis in flocks that were divided into small breeding pens, abortions occurred in the majority of the pens. If the rams were the source of the infection, the majority of them were infected, which was considered unlikely.

Fourteen ewes were inoculated, 4 intravenously and 10 *via* the cervix, during the second oestrous period before breeding. Although none of the ewes aborted, 4 did not lamb, possibly as a result of temporary infection. At breeding time, 4 ewes were inoculated intravenously and 42 *via* the cervix. Although none of the 46 ewes aborted, 11 did not lamb, possibly because of sterility resulting from a temporary infection. Eight of the 11 were carried through another pregnancy without evidence of infection.

Investigation of outbreaks of vibriosis in sheep has not indicated a sterility problem such as occurs in cattle, but rather one of abortion late in pregnancy. However, the high proportion of non-pregnant ewes in some of the experimental groups may have been due to transitory infection.

Ewes inseminated with semen containing pathogenic *V. fetus* organisms did not abort. Ewes were resistant to intravenous infection during the first month of pregnancy, but were quite readily infected during the second, third, or fourth month. Ewes which neither aborted nor lambed after inoculation with *V. fetus*, as well as ewes that aborted after inoculation, were carried through an additional pregnancy without evidence of infection.

Both field and experimental findings indicate that the ram is not the source of the

infection in ewes. The relative ease with which abortion can be produced by inoculation late in pregnancy indicates the possibility of natural infection during gestation from infected premises or some other, as yet undetermined, source.

TUCKER, J. O. & ROBERTSTAD, G. W. (1956). Experimental vibriosis in sheep.—*J. Amer. vet. med. Ass.* **129**, 511-513. 1049

Fifty virgin yearling ewes from a flock with no history of abortion were bred with rams which had never been exposed to vibriosis. Twelve ewes acted as uninoculated controls (Group I). Thirteen (Group II) were given a series of 11 oral inoculations, over a period of a fortnight, with a mixture of 4 strains of *V. fetus*, beginning at the 72-75th day of pregnancy. A further 13 ewes (Group III) received, on consecutive days, beginning at the 92-97th day, 3 oral inoculations of organisms from a recent culture of ovine origin. The remaining 12 ewes (Group IV) were inoculated twice, beginning at the 124-127th day of pregnancy, with organisms recovered from Group III.

The dose of inoculum was not standardized, a medium containing the organisms being spread over chopped hay.

All lambs born, whether dead or alive, were cultured for *V. fetus*. Lambs from Group I and II were all negative. Eight of the ewes in Group III aborted within 14 days, and the remainder within 57 days of inoculation, only the last lamb being born alive. *V. fetus* was isolated from all lambs aborted within 32 days of inoculation but from none aborted later. All of the 11 lambs born (4 alive and 7 dead) in Group IV were born within 15 days of inoculation except one, born alive 24 days after inoculation. *V. fetus* was isolated from all lambs born within 13 days of inoculation, except one which was born alive. The organism was not recovered from later lambs.

Liver lesions, often regarded as characteristic of vibriosis, were confined to lambs in Group IV, i.e., those born to ewes inoculated nearest to term.—H. SCOTT McTAGGART.

BEVERIDGE, W. I. B. (1956). Foot-rot of sheep. A modern approach to an old problem.—*Vet. Rec.* **68**, 963-965. Discussion: pp. 965-968. 1050

A description of the condition under the headings of clinical manifestations, cause, control, therapy and diagnosis. Repeated attempts to isolate the causal organism at Cambridge during the last five years have all failed, despite the prevalence of the organism in smears.

Failure to reproduce the good growth originally obtained in Australia and the U.S.A. is as yet unexplained. The control measures described are those of detection, segregation and treatment of all infected animals, including carriers that are not lame, as originally advocated in Australia by Beveridge (1941) [V.B. **12**, 104-105]. B. considers that repeated treatment without segregation is unlikely to be effective except in very small flocks.

—H. SCOTT McTAGGART.

BAXTER, J. T. & SMYTH, W. G. (1956). A comparison of two chloramphenicol tinctures in the treatment of foot-rot in sheep.—*Vet. Rec.* **68**, 668-670. 1051

Among a flock of 90 sheep those affected by foot rot received treatment with two different types of chloramphenicol tincture. A 10% tincture cured 16 of 24 feet in one application and 4 more in two applications, thus confirming the results obtained by others. A 5% tincture containing an undisclosed proportion of dapsone gave almost as good results, curing 22 of 40 feet in one, and 10 more in two applications.

—G. P. MARSHALL.

NETER, E. (1956). Bacterial hemagglutination and hemolysis.—*Bact. Rev.* **20**, 166-188. [Author's summary modified.] 1052

Perusal of the numerous papers dealing directly or indirectly with bacterial haemagglutination and haemolysis reveals that advances have been made during the last decade. It is obvious that numerous problems await elucidation. Far more is known about indirect than direct bacterial haemagglutination, whereas the reverse is true with viral haemagglutination. The study of the interaction of bacteria and their antigens with r.b.c. has yielded valuable information on the antigenic composition of various micro-organisms and of erythrocytes. The haemagglutination and haemolysis reactions have been useful as tools for the detection and titration of numerous bacterial antigens and antibodies. *Dow*

LARSH, H. W., HINTON, A. & COZAD, C. (1956). Natural reservoir of *Histoplasma capsulatum*.—*Amer. J. Hyg.* **63**, 18-27. 1053

A search for *H. capsulatum* by mouse inoculation methods in soils from endemic and non-endemic histoplasmosis areas in 17 States of the U.S.A., resulted in 47 isolations from 1,024 samples. 13 isolates were obtained by sampling at random, 17 from samples collected at sites of known or suspected human infections, and 22 from the soil and litter of fowl houses. The authors consider that man and animals are

exposed to a common source of infection when soil and climatic conditions are favourable for the growth of the fungus.—P. K. C. AUSTWICK.

MARIAT, F. & SEGRETAIN, G. (1956). Étude mycologique d'une histoplasmosse spontanée du singe africain (*Cynocephalus babuin*). [Spontaneous histoplasmosis in African monkeys.]—*Ann. Inst. Pasteur*, **91**, 874-891. [English summary.] 1054

Five cases of chronic cutaneous histoplasmosis in monkeys were studied. The parts affected were the muzzle, tail, limbs and buttocks. Radiography of the tail revealed opacity of the affected tissues and osteolysis leading to spontaneous fracture. The fungus was detected microscopically in the cutaneous lesions and in the axillary and inguinal lymph nodes. Its morphological and cultural characteristics were described in detail. Its growth in culture was very slow; at least a month elapsed before colonies were seen. The disease was reproduced experimentally in a monkey by s/c inoculation of infected pus. Lesions first appeared 3 months after inoculation. Pathogenicity of the fungus for lab. animals was small, but g. pigs infected by the intratesticular route developed orchitis. The classification of the fungus was discussed.—M.G.G.

CAMARA, H. -A. (1956). La blastomycose oculaire du cheval. Contribution à l'étude de la maladie à l'occasion de cas observés en Afrique Occidentale Française. [Ocular blastomycosis in horses.]—*Rev. Elev.*, **9**, 149-166. [English and Spanish summaries.] 1055

After a fully documented historical introduction in which it is stated that this disease was first described in 1896, the symptomatology, diagnosis, and treatment of ocular blastomycosis in horses are described and discussed on the basis of 10 cases observed in Senegal. The first sign of ocular blastomycosis is a transient ulcer at the internal commissure of the eyelid. Later a flat-edged pruriginous ulcer appears in the suborbital region and spreads towards the forehead. (The lymphatic system is not invaded and this allows ocular blastomycosis to be differentiated from epizootic lymphangitis.) In the 6 cases treated, the condition yielded to alternating i/v injections (daily or according to the tolerance of the animal) of mercury bi-iodide (20 ml. of a 1:60 soln. in KI) and Lugol's iodine (20 ml.). The causative organism is a yeast very similar to, if not identical with, *Cryptococcus mirandei*.

—G. C. AINSWORTH.

AJELLO, L. A., REED, R. E., MADDY, K. T., BUDURIN, A. A. & MOORE, J. C. (1956). Ecological and epizootiological studies on canine coccidioidomycosis.—*J. Amer. vet. med. Ass.*, **129**, 485-490. 1056

The clinical histories of 5 dogs which developed coccidioidomycosis about 2 years after being brought to Tucson, Arizona, U.S.A., and the pathological findings in one of them are reported. A soil sample collected near a rodent's burrow in the yard where the dogs exercised, yielded *Coccidioides immitis*. An arid climate, a mildly alkaline soil, and freedom from severe frosts may best enable the organism to develop saprophytically in soil.—A. ACKROYD.

CRUICKSHANK, C. N. D. & TROTTER, M. D. (1956). Separation of epidermis from dermis by filtrates of *Trichophyton mentagrophytes*.—*Nature, Lond.*, **177**, 1085-1086. 1057

By growing *Trichophyton mentagrophytes* in a simple non-toxic fluid medium the authors demonstrated that the culture filtrates were proteolytic and caused the epidermis and dermis of thin slices of g. pig ear skin to separate, after 2 hours' incubation. Further tests showed that the dye was released from dyed hide powder over a range of pH 6-11. This action may explain the formation of vesicles following exposure to friction in skin infected with dermatophytes.—P. K. C. AUSTWICK.

GUILHON, J., CHARTON, A. & DURIEUX, J. (1955). Teigne du mouton. [Ringworm in sheep.]—*Bull. Acad. vét. Fr.*, **28**, 465-468. 1058

This note records ringworm (caused by *Ctenomyces granulosus* [*Trichophyton granulosum*]) in 3 sheep (of a flock of 300) in France. Signs of the infection were small smooth or crusted lesions of about 1 sq. cm. at the base of the nose. The identity of the dermatophyte was determined by culture.—G. C. AINSWORTH.

HAJSIG, M. & STILINOVIC, Z. (1956). Zapažanja o saharomikozi kunića. [Saccharomyces guttulata infection in rabbits.]—*Vet. Arhiv.*, **26**, 81-85. [In Croat. English and German summaries.] 1059

S. guttulata was isolated from faeces of rabbits in a large rabbitry. Clinically there was anorexia, bloat, catarrhal inflammation of the upper respiratory mucosae and the conjunctivae. Droppings were slimy and stuck together. Treatment with a proprietary methylene blue preparation was successful. The authors discussed the role of vitamin A deficiency as a

predisposing factor. The organism grew at 37°C. and a pH of 3.5 in a medium consisting of gelatin and 10% glycerol.—E.G.

AJELLO, L. (1956). Soil as natural reservoir for human pathogenic fungi.—*Science*. 123, 876-879. 1060

The author reviewed the literature on the isolation of pathogenic fungi from soil, and reported results of the examination of 1,215 soil samples from North and South America, Hawaii and Nigeria. Screening was carried out by mouse inoculation and by examining strands of sterilized hair that had been placed in contact with the moistened soil, and 226 isolates of pathogenic fungi were obtained including *Histoplasma capsulatum*, *Allescheria boydii*, *Cryptococcus neoformans*, *Coccidioides immitis*, *Candida albicans* and *Microsporum gypseum*. Emphasis is laid on the great value of these observations in the epidemiology and control of mycoses.—P. K. C. AUSTWICK.

HYSLOP, N. ST. G. (1956). Duration of immunity in cattle vaccinated with egg-adapted contagious bovine pleuropneumonia vaccine.—*Brit. vet. J.* 112, 519-522. [Author's summary modified.] 1061

Sixty-seven indigenous zebu and European \times zebu cattle were vaccinated against bovine contagious pleuropneumonia with a batch of egg-adapted vaccine of medium potency. An increasing proportion of severe local reactions to subcutaneous challenge, among groups challenged at intervals, revealed a decline in resistance during three and a half years. None of the vaccinated cattle died as a result of challenge, even at the end of the period; 9 of 19 unvaccinated animals died.

GURTÜRK, S. (1956). Elektronenmikroskopische Untersuchungen über die Morphologie des infektiösen Pneumonie-Erregers der Ziegen. [Electron microscopic study of the cause of caprine contagious pleuropneumonia.]—*Dtsch. tierärztl. Wschr.* 63, 497-500. 1062

Caprine contagious pleuropneumonia organisms, grown in allantoic fluid of chick embryos 10-12 days old, were examined with an electron microscope. They were of almond shape, in size from 75-250 μ and had filament-like appendages but neither flagella nor cell membranes. When grown in a medium consisting of broth with 10% horse serum they were spherical and about the same size as those grown in allantoic fluid. The filamentous processes, however, were thicker and ramified. The agent of

caprine contagious pleuropneumonia was larger than P.P.L.O. isolated from man and chicks.—E.G.

DOMERMUTH, C. H. & JOHNSON, E. P. (1956). A new serological technique—freeze agglutination, I. Application to chronic respiratory disease of chickens.—*Amer. J. vet. Res.* 17, 778-780. [Authors' summary modified.] 1063

An account of a new serological technique, freeze agglutination, developed to detect birds infected with pleuropneumonia-like organisms (PPLO). Serum is frozen in capillary tubes. A PPLO antigen, grown in a modified Difco PPLO medium and concentrated, is subsequently delivered into the tubes adjacent to the serum and the tubes are incubated horizontally for 5 min. at 37°C. The layered serum and antigen are then frozen horizontally, thawed in a horizontal position at 37°C., rotated to the vertical, slowly inverted, rotated to an upright position, and examined for clumping. Sera producing no clumped material are regarded as negative and those producing clumped material as positive for PPLO.

Data obtained by comparison of this test with the haemagglutination-inhibition and the macroscopic tube-agglutination test indicated that the test is relatively specific, sensitive, and economical. Preliminary evidence indicated that suitable modifications of the test would also be useful in other antigen-antibody complexes.

SAKAZAKI, R., NAMIOKA, S. & MIURA, S. (1956). Enteric bacteria in apparently healthy animals.—*Jap. J. vet. Res.* 4, 51-56. [In English.] 1064

Isolates were made from the mesenteric lymph nodes and faeces of horses, cattle and dogs. *Escherichia coli* was the most common organism in all cases. *Cloaca* and *Klebsiella* were frequent in horses and cattle but rare in dogs. The reverse was true of *Salmonella* and *Proteus*.—A. SEAMAN.

SAKAZAKI, R. & MIURA, S. (1956). The enteric bacterial flora of the intestinal tract of healthy horses.—*Jap. J. vet. Res.* 4, 57-63. [In English.] 1065

Escherichia coli was the predominant organism in 9 of 11 horses. *E. freundii* and *Klebsiella* predominated in the other 2. The serological types of *E. coli* were studied in 5 horses over periods of 3-5 months. Some of the serotypes were transient, others persistent in the flora. *E. freundii* and *Klebsiella* strains were persistent in 2 of the horses.—A. SEAMAN.

HAENEL, H. & MÜLLER-BEUTHOW, W. (1956). Vergleichende quantitative Untersuchungen über Keimzahlen in den Faeces des Menschen und einiger Wirbeltiere. [Comparative quantitative study of microorganisms in the faeces of human beings and some vertebrates.]—*Zbl. Bakt. I. (Orig.)* **167**, 123-133. [English, French and Russian summaries. English summary modified.] **1066**

Examinations of the faecal flora of man, g. pig, rat, horse, hen, cow, dog and rabbit for the proportion of anaerobes, aerobes, lactobacilli, Coli-group organisms, enterococci, staphylococci, fungi, spores and proteus demonstrable by means of selective media, revealed that some animal species had certain types of intestinal flora in common. Man, rat, hen and dog had comparable proportions of aerobes, anaerobes, lactobacilli, Coli-group organisms and enterococci. Only in the dog were staphylococci scarcely if ever demonstrable. Fungi were more frequent in the rat than in other species. The g. pig, horse and rabbit had comparable counts of anaerobes and lactobacilli, whereas the horse had a higher number of aerobes. In these three species, if Coli-group organisms occurred at all, they were in insignificant quantities. Cows had low counts with a relatively high proportion of Coli-group organisms. The lactobacilli in man and g. pig were predominantly *L. bifidus*; in the rabbit, hen and rat they were partly *L. bifidus*. In no case were Coli-group organisms quantitatively the main flora of the faeces.

NOTTLE, M. C. (1956). Rumenal flora studies in the sheep. VI. Diurnal, daily, and seasonal fluctuations in the concentration of "free" rumen bacteria and in rumen pH.—*Aust. J. biol. Sci.* **9**, 593-604. [Abst. from author's summary.] **1067**

Both the microflora and the pH of the rumen of adult sheep varied during the day, from day to day and from season to season. N. suggested that the seasonal variations in the microflora may be influenced by light and temperature as well as by diet.

See also absts. 1201 (diseases in animals in Surinam); 1204 (control of calf diseases); 1296 (Corynebact. pyogenes as apparent cause of testicular atrophy and epididymal suppuration in a bull); 1315 (bacterial content of some detergents); 1317 (book, eradication of bovine TB.); 1318 (Annual review of microbiology, vol. 10).

DISEASES CAUSED BY PROTOZOAN PARASITES

LEVINE, N. D., WATRACH, A. M., KANTOR, S. & HARDENBROOK, H. J. (1956). A case of bovine trypanosomiasis due to *Trypanosoma theileri* in Illinois.—*J. Parasit.* **42**, 553. **1071**

T. theileri was found in blood smears from a heifer, 2½ years old, that had diarrhoea and

ELSDEN, S. R., VOLCANI, B. E., GILCHRIST, F. M. C. & LEWIS, D. (1956). Properties of a fatty acid forming organism isolated from the rumen of sheep.—*J. Bact.* **72**, 681-689. [Authors' summary copied *verbatim*.] **1068**

The isolation and properties of a gram negative, anaerobic organism are described. It does not seem advisable at this time to try to classify the few available strains; however, the organism is closely related to members of the genera *Neisseria* and *Moraxella*. This organism ferments DL-lactate, glucose, and fructose. The fermentation products from DL-lactate are hydrogen, carbon dioxide, acetate, propionate, *n*-butyrate, and *n*-valerate. The products from glucose and fructose are acetate, *n*-butyrate, small amounts of *n*-valerate and *n*-hexanoate, hydrogen, and carbon dioxide. Growing cultures do not decarboxylate added succinate.

WIGAND, R. (1956). A complement-fixation reaction with *Haemobartonella muris* and *Eperythrozoon coccoides*.—*Nature, Lond.* **178**, 1288-1289. **1069**

Antigens of *H. muris* and *E. coccoides* were prepared from heavily infected blood cells of splenectomized rats and mice; immune sera were obtained from rats and mice after recovery from infection. Using the micro-method of complement fixation, W. established the specificity of the reaction.—E.V.L.

GRABAR, P. (1956). Review of the microbiological and immunological literature published in 1955 in the U.S.S.R. In Annual Review of Microbiology Vol. 10. pp. 51-84. [Palo Alto, California: Annual Reviews, Inc.] **1070**

An objective survey of Russian literature on the general principles of microbiology and immunology, giving the reader an insight into current trends in research in the U.S.S.R. It is intended to publish further reviews of this kind in future issues of the Annual Review of Microbiology.—R.M.

atony of the rumen and had aborted 3 weeks previously. A calf was injected i/v with 100 ml. citrated blood from the heifer. *T. theileri* was found in its blood one day later. The calf was depressed and had slight fever on the 4th and 5th days after injection. Trypanosomes

were still present in its blood 12 days after injection, but 2 months later they were no longer found. No trypanosomes were seen in blood smears from the heifer's dam and sister. The literature on *T. theileri* infection of cattle was reviewed.—M.G.G.

HOLZ, J. & TANDJUNG, R. (1956). Über die Möglichkeit einer intramuskulären oder subcutanen Surra-Prophylaxe mit Naganol (Bayer 205) bei Büffeln und Rindern. [Intramuscular or subcutaneous administration of suramin, combined with hyaluronidase in the prophylaxis of surra in buffaloes and cattle.]

—*Tierärztl. Umsch.* 11, 246-248. 1072

A 10% soln. in distilled water of 1 g. of suramin/150 kg. body wt., administered i/m or s/c to buffaloes and cattle for the prevention of surra, caused in some animals local swellings and necrosis. When, however, 50 units of hyaluronidase were added to a soln. made from 3 g. of the drug, resorption following i/m inj. was rapid, without local reactions and was generally well tolerated. Details were given of prophylactic treatment in 34 buffaloes and cattle. The trypanocidal action of the drug was not affected by the addition of the enzyme since treated animals withstood s/c challenge with 4,000-6,000 *Trypanosoma evansi* organisms four weeks after treatment.—E.G.

BAKER, J. R. (1956). Studies on *Trypanosoma avium* Danilewsky 1885. I. Incidence in some birds of Hertfordshire. II. Transmission by *Ornithomyia avicularia* L. III. Life cycle in vertebrate and invertebrate hosts.—*Parasitology* 46, 308-320; 321-334; 335-352. [Abst. from author's summaries.] 1073

I. A survey of 227 rooks and 70 jackdaws for *T. avium* infection, by culture of peripheral blood or bone-marrow on N.N.N. medium, revealed that 27 rooks and 6 jackdaws were infected. As only 78 of the rooks were examined at a time of year when the trypanosomes are present in the peripheral circulation and at an age when adults of *Ornithomyia avicularia* (the vector of the parasite) are present, and 26 of these 78 were infected, the true incidence in rooks is probably about 33%. The trypanosome is spindle-shaped, of average length (excluding flagellum) 48.2 μ and width 5.5 μ . A tapering aflagellar region extends (on average) 14.1 μ beyond the kinetoplast.

II. The hippoboscid fly *O. avicularia* is a vector of *T. avium* in Great Britain. The metacyclic trypanosomes develop in its hind-gut, and when an infected fly is eaten they penetrate the membranes of the buccal cavity and/or oeso-

phagus and crop. *T. avium* failed to develop in nymphs of *Rhodnius prolixus* and an adult *Culex molestus*. No flagellates were found in mites from an infected bird.

III. B. described the life-cycle of *T. avium* in both its hosts. In *O. avicularia* it undergoes a cyclical development in the alimentary canal. Multiplication occurs in the crithidial stage; finally, pyriform haptomonad crithidia appear in the hind-gut of the vector and change into the infective metacyclic trypanosomes. After penetrating the mucous membranes of the bird (when it has eaten the vector), the metacyclic trypanosomes probably invade the lymphatic system and there grow into the large forms seen in the blood some 18-24 hours later. The trypanosomes persist in their natural hosts (but not in canaries) throughout the winter, mostly in the bone-marrow; in spring they reappear in the peripheral blood.

PŘIBYL, E. & LANGER, J. (1956). Some experiences with the diagnosis and therapy of trichomoniasis in bulls.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II, pp. 29-31. [French summary.] 1074

Trichomonas foetus infection was cured in 17 of 28 bulls by acriflavine and bovoflavine ointment and oral doses of potassium iodide. A few months later two of the bulls which had been considered cured had relapses. The authors described diagnosis by culture and by transmission to laboratory animals. Microscopic examination, however, was the method of choice.—E.G.

RIECK, G. W. (1956). Wasserlösliche Vitamine als Wachstumsfaktoren für *Trichomonas foetus*. [Water-soluble vitamins as growth factors for *Tr. foetus*.]—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II, pp. 32-34. [In German. English summary.] 1075

Growth of *T. foetus* was studied in a basic medium consisting of serum-peptone-broth, to which 1,000 i.u. penicillin and 400 μ g. of streptomycin sulphate per 6 ml. had been added. Additions of folic acid or pantothenic acid stimulated cell division, but the effect of a mixture of both vitamins was not greater than that obtained with one only. When 1% glucose was added to the vitamin mixture there was a significant growth response. Thiamine, lactoflavin, nicotinic acid amide and cobalamin produced no significant results. Ascorbic acid was a strong growth stimulant but was inhibited by the presence of glucose.—E.G.

HIREGAUDAR, L. S. (1956). A new species of *Eimeria* from a cow-calf in Bombay State.—*Curr. Sci.* **25**, 197.

1076

A hitherto undescribed species of *Eimeria*, tentatively named *E. mundaragi* was isolated from faeces of a calf with concurrent *E. zurni* infection.—E.G.

ARUNDEL, J. H. & SUTHERLAND, A. K. (1956).

The value of nitrofurazone in experimental *Eimeria tenella* infection of chickens.—*Vet. Rec.* **68**, 769-772.

1077

Two experiments were reported. (1) Nitrofurazone (0.0196% in the mash for 7 days) and sodium sulphadimidine (0.2% in the drinking water for 5 days) were equally effective in preventing death of chickens from an infection at 17 days of age (40,000 sporulated oocysts of *E. tenella*) which killed 15 out of 30 controls. (2) Nitrofurazone (0.01% given continuously in the mash to 100 chickens inoculated after 18 days with 800 sporulated oocysts of *E. tenella*) did not interfere with the development of immunity to challenge with 55,000 oocysts during the 1st-10th day after inoculation. On the basis of number of oocysts produced, it was demonstrable that immunity had developed in both the treated and in an equal control group (similarly inoculated but fed normal mash) within 96 hours of the initial infection. The authors consider that their findings are at variance with those reported by Davies & Kendall [V.B. **26**, 1216].—F.E.W.

DAVIES, S. F. M. (1956). Intestinal coccidiosis in chickens caused by *Eimeria necatrix*.—*Vet. Rec.* **68**, 853-857. [Author's summary modified.]

1078

Pure suspensions of the oocysts of *E. necatrix* were prepared after isolation of the parasite from natural mixed infections.

Observations on the life-cycle of *E. necatrix* agreed closely with the description recorded by Tyzzer *et al.* (1932), except for minor differences in the prepatent period, the minimum period of sporulation, and the average size of the oocysts. *E. necatrix* was found to be capable of producing an acute haemorrhagic form of intestinal coccidiosis, young birds being most severely affected. D. described the effects of a highly active combination of 0.4% sulphadimidine with 0.02% pyrimethamine on the various developmental stages of *E. necatrix*, and discussed the possibility of successful control.

SHUMARD, R. F. (1956). The coccidiostatic activity of soluble furacin against *Eimeria*

necatrix.—*J. Parasit.* **42**, No. 4. -Sect. 2. (Suppl.) p. 24.

1079

Of various dosages tested, 0.008% of a water-soluble nitrofuran compound in the drinking water for at least a week was the most effective against experimental *E. necatrix* infection in fowls. It prevented mortality when treatment began up to 4 days after the administration of oocysts. Challenge doses showed that the drug did not interfere with the development of immunity.—M.G.G.

RAMA RAO, R. (1956). Rauvolfia alkaloids in avian malaria (*P. gallinaceum*).—*Curr. Sci.* **25**, 357.

1080

Crude total alkaloids of *Rauvolfia* in doses of 200 mg./kg. body wt. and reserpine in doses of 20 mg./kg. body wt. had no effect on *Plasmodium gallinaceum* infection in fowls.—E.G.

BECKER, E. R., HOLLANDER, W. F. & PATTILLO, W. H. (1956). Naturally occurring *Plasmodium* and *Haemoproteus* infection in the common pigeon.—*J. Parasit.* **42**, 474-478.

1081

Pl. relictum and *H. sacharovi* were recovered from a number of pigeons (*Columba livia*) in Central Iowa. Many of the *Pl. relictum* infections were latent and could be diagnosed only by i/v injection of blood samples into squabs. The blood of one pigeon transmitted *Pl. relictum* to only one out of 3 squabs, indicating a very low residual infection. A *Haemoproteus*, considered to be *H. columbae*, was isolated from a wild pigeon in South Carolina.

—M.G.G.

GAYOT, G. & LOQUERIE, R. (1956). Recherches sur la theilériose. IV. Sensibilité comparée de diverses races ou de croisements à la theilériose à *Th. dispar*. [Research on theileriosis. IV. Comparative sensitivity of different breeds and crosses to *Th. dispar*.]—*Rec. Méd. Vét.* **132**, 845-851.

1082

S/c inoculation of *Th. dispar* produced no reaction in 18 pure-bred zebu, whereas Tarentaise cattle developed typical infections. Two out of 7 cross-bred cattle were resistant; the responses of the 5 others varied, but appeared to be less severe than in the Tarentaise cattle.

—M.G.G.

ZUBIATE, A. (1956). Behandlung der Anaplasmosis der Rinder mit Spirotrypan "forte" ad us. vet. [Treatment of anaplasmosis in cattle with "Spirotrypan".]—*Vet. -med. Nachr.* No. 3, pp. 181-184.

1083

"Spirotrypan" (an arsphenamine deriva

tive) was claimed to be 100% effective against anaplasmosis in cattle in Peru. In many cases a single i/v injection of 20-40 ml. was sufficient; in the remainder a second dose of 20 ml. given a few days later brought about a complete cure. There were no side effects. Recovery was rapid and milk yield soon became normal.

—M.G.G.

FELDMAN, H. A. & MILLER, L. T. (1956). Serological study of toxoplasmosis prevalence.—*Amer. J. Hyg.* **64**, 320-335. **1084**

Of 749 samples of serum from lab. animals, cattle, dogs, pigs, sheep, goats, horses and cats in various parts of the U.S.A., 178 were positive to the dye test for *Toxoplasma* antibodies at a titre of 1:16 or over. One of 9 pigs and 6 of 7 dogs in Honduras were positive. None of 33 monkeys from India and the Philippines was positive. There was marked variation between groups from the same area; for example, of 4 herds of cattle in the vicinity of Ithaca, N.Y., 38% of one herd and 48% of another were positive; the 2 other herds were negative. The reliability of the dye test was discussed.

—M.G.G.

PANGALOS, G. E., PAVLATOS, M. & MERCIER, P.

See also abst. 1201 (diseases of animals in Surinam).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

UBERTINI, B., NARDELLI, L., BAREI, S. & SANTERO, G. (1956). Etudes sur la culture *in vitro* du virus aphthéux selon Frenkel. I. Développement du pouvoir infectant, déviant le complément et immunisant durant 72 heures d'incubation. [Cultivation of the virus of foot and mouth disease *in vitro*. I. Development of infectivity, complement-fixation, and immunizing properties during 72 hours of incubation.]—*Zbl. VetMed.* **3**, 419-453. [In French. English, German and Spanish summaries.] **1087**

With strain O₂/139 cultured *in vitro* on ox tongue epithelium, infectivity was measurable in the tissue after 6 hours' incubation, being maximal at 18 hours. The complement-fixing and immunizing activities ran parallel and were maximal at 24 hours; from then on both declined, but the immunizing activity increased significantly from the 60-65th hour. The infectivity and the c.f. activity of the virus developed first on the tissue and later in the cultural liquid. From the 60th hour the infectivity was higher in the liquid. The complement-fixing activity

(1956). The Sabin-Feldman dye-test.—*Trans. R. Soc. trop. Med. Hyg.* **50**, 583-586. **1085**

The authors proposed a modification of the dye-test. Instead of adding methylene blue to the incubated mixture of serum, toxoplasms, and accessory factor, they prepared smears by spreading a drop of the mixture on a slide which is then fixed by immersion in Hoffman's solution. The fixed smears are stained by the May-Grünwald-Giemsa stain. The advantage with this method is a stronger contrast between stained and unstained toxoplasms.—M.G.G.

PIERCE, A. E. (1956). Protozoan diseases transmitted by the cattle tick.—*Aust. vet. J.* **32**, 210-215. **1086**

This paper summarizes present knowledge of the protozoan diseases transmitted to cattle in Australia by the tick, *Boophilus microplus*. The major organisms are *Babesia argentina*, *B. bigemina*, and *Anaplasma marginale*. The risk of outbreaks in endemic areas resulting from intensifying control measures and reducing the tick populations to levels too low to maintain the prematurity state is discussed, and suggestions are made for further research to obtain information whereby this risk can be explored.

—F. H. S. ROBERTS.

in the liquid developed later than the infectivity. With strain A/145 the infectivity of the epithelium reached its maximum titre in culture *in vitro* after 12 hours' incubation, and the c.f. and immunizing activities at 24 hours. After 48 hours the immunizing activity, as measured by the neutralization index, appeared to run independently of the c.f. activity, though there was still a certain parallelism on the basis of the protective dose₅₀ of the vaccines: With strain A/165, *in vivo*, the infectivity also developed most rapidly, being demonstrable 6 hours after infection; at this time c.f. activity was not demonstrable and the immunizing activity was very weak. It was clearly demonstrated, therefore, that a single titration of the virulence of a virus-culture cannot indicate the potency of the vaccines produced from it. It would be an advantage to have an international standard antigen available, containing a given number of c.f. units, and a preliminary titration of the c.f. activity could then replace the titration of infectivity. This would be a cheaper and simpler test, as well as being more reliable.

—F.E.W.

LAMBERTS, M. C., BUHR, W. H. B. & VAN DER MERWE, J. P. (1956). Observations on the transmission of foot and mouth disease to game and controlled transmission of the disease from game to cattle and vice versa by means of contact.—*J. S. Afr. vet. med. Ass.* 27, 133-137.

1088

A kudu experimentally infected with F. & M. disease died from the infection after 6½ days but 2 cattle in contact with the animal did not develop any visible lesions up to 31 days after the beginning of the experiment. In the reverse experiment one of 2 cattle was experimentally infected. The disease spread to the second animal but not to an impala in contact with the cattle.—M.G.G.

FELLOWES, O. N., DIMOPOULOS, G. T., TESSLER, J., HESS, W. R., VARDAMAN, T. H. & CALLIS, J. J. (1956). Comparative titrations of vesicular stomatitis virus in various animal species and in tissue culture.—*Amer. J. vet. Res.* 17, 799-802. [Authors' summary modified.]

1089

New Jersey and Indiana types of bovine vesicular stomatitis virus were titrated in tongues of calves and adult cattle, and in chick embryos, Swiss albino mice, g. pigs, fowl tongue, and in tissue cultures of g. pig kidney cells. The 3 to 4-week-old mice, inoculated intracerebrally, and the chick embryos were the most sensitive and gave high LD₅₀ values. The I.D.₅₀ values of the tongues of adult cattle and of the tissue cultures were about equal and came next in order of sensitivity. Calf and fowl tongue titrations gave lower I.D.₅₀ values. The g. pig gave the lowest values.

Titrations of suspensions of chorioallantoic membranes infected with the two types of virus were made in unweaned mice (7-10 days old) inoculated intracerebrally and intraperitoneally, and in chick embryos. With the Indiana type but not with New Jersey type virus, LD₅₀ values were greater in mice.

BURNS, K. F., FARINACCI, C. F., MURNANE, T. G. & SHELTON, D. F. (1956). Insectivorous bats naturally infected with rabies in southwestern United States.—*Amer. J. publ. Hlth.* 46, 1089-1097.

1090

Rabies virus was isolated in Texas and Louisiana from the insectivorous bats *Tadarida brasiliensis cynocephala*, *Lasiusurus borealis borealis* and *Antrozous pallidus pallidus*. Asymptomatic carriers were also found among bats in New Mexico. A great number of serum samples from apparently healthy bats contained antibodies, but a large percentage of brain tissue

samples from infected bats did not contain Negri bodies. During this investigation four strains of a salivary gland virus, antigenically related to St. Louis encephalitis virus, were isolated.—E.G.

ENRIGHT, J. B. (1956). Bats, and their relation to rabies. In Annual Review of Microbiology Vol. 10, pp. 369-392. [Palo Alto, California: Annual Reviews, Inc.]

1091

A valuable review of the problem of bat-transmitted rabies in cattle and other mammals on the American continent.—R.M.

ERCEGOVAC, D. T. (1956). Ergebnisse experimenteller Arbeiten auf dem Gebiet der Tollwutprophylaxe. [Experimental research on rabies prophylaxis.] — *Wien. tierärztl. Mschr.* 43, 288-306. [English, French and Italian summaries.]

1092

E. stated that results of vaccination against rabies before or after exposure indicated that failure of post-exposure vaccination did not depend on the vaccine but on the fact that antibodies can only neutralize the virus before it enters the cells of the c.n.s. The virus is stated to be carried by currents in the peripheral nerves from the site of exposure to the c.n.s. which it may reach within a few hours. The incubation period is shorter when large amounts of virus enter the nerve cells. The incubation period is therefore the time when the virus is actively multiplying within the cells.

Based on the theory of intraneurial currents, E. protected infected rabbits by i/m inj. of immune serum, given within one hour of infection, in 14 different sites of the same innervation region. Further experiments with longer intervals between infection and serum treatment are contemplated.—E.G.

REAGAN, R. L., YANCEY, F. S., SING CHEN CHANG & BRUECKNER, A. L. (1956). Rabies street virus in the Syrian hamster.—*Amer. J. vet. Res.* 17, 793-794. [Abst. from authors' summary.]

1093

Hamsters inoculated intracerebrally with the dog brain virus developed furious rabies on the 6th day. Mice inoculated intracerebrally with suspensions of brain and salivary glands from the hamsters developed symptoms of rabies in 6-10 days and numerous Negri bodies were demonstrable in the brain of each mouse. Hamsters inoculated with the fox brain virus also developed furious rabies on the 6th day, and mouse inoculation tests yielded similar results.

SCHWÖBEL, W. & MAYR, A. (1956). Die Züchtung des Vaccinevirus in Zungengewebekulturen vom Rind. [Cultivation of vaccinia in tissue cultures of bovine tongue.] — *Zbl. Bakt. I.* 167, 187-200. [English, French and Russian summaries.] **1094**

Cells from the superficial layers of foetal cattle tongue could be propagated in direct transfers: vaccinia virus grew readily in the cultures with a standard medium of 70% amniotic fluid of cattle, 20% horse serum and 10% chick embryo extract. The virus remained infective after 20 direct tissue culture passages.

—E.V.L.

RAFYI, A. & MIR CHAMSY, H. (1956). Seven years' control of sheep pox in Iran with an adsorbed tissue vaccine on aluminium gel.— *Brit. vet. J.* 112, 541-547. **1095**

During the past 7 years over 20 million sheep have been vaccinated in Iran with formalized aluminium gel sheep pox virus. During the last year 4 million doses of the vaccine without formaldehyde have been distributed, and this appears to be equally effective in the field. The virus is produced by the routine procedure of Borrel, using Merino-Iranian crossbred sheep injected with the Roumanian strain of sheep pox virus. The virus is titrated to obtain the reaction dose (R.D.). Repeated experiment has shown that the immunizing dose of the adsorbed virus must contain 100 R.D. in order to produce a satisfactory immunity lasting a year. The aluminium gel is prepared by the Willstätter technique. Titrated virus is added to the gel so that 1 ml. of the final product contains 200 R.D., i.e., two immunizing doses. Thiomerthiolate is then added as preservative to give a final dilution of 0·01%.

—H. SCOTT McTAGGART.

MAYR, A. & WITTMANN, G. (1956). Zur Ringzonenbildung in virusinfizierten tierischen Geweben. I. Ringzonenbildung bei Pockenviren auf der Chorioallantoismembran des Hühnerembryos und auf der Kaninchenhaut. [Ring-zone formation in animal tissues infected with viruses. I. The phenomenon with pox viruses on chorio-allantoic membrane of chick embryos and on the skin of rabbits.] — *Zbl. VetMed.* 3, 219-231. [English, French and Spanish summaries.] **1096**

Lesions in the form of rings appeared in the chorio-allantoic membrane of chick embryos following infection with fowl pox, cow pox and strains of vaccinia virus. The number of lesions depended on the length of survival of the

infected embryos. Reaction to fowl pox virus was more marked than reaction to the other viruses. In rabbits circular skin infiltrations around the pock lesions marking the site of infection with cow pox virus, resembled the ring zones seen in chick embryos. The possible value of this phenomenon in the study of tissue and cell reaction to viruses was discussed.

—E.G.

DOWNIE, A. W. & DUMBELL, K. R. (1956). Pox viruses. In Annual Review of Microbiology Vol. 10, pp. 237-252. [Palo Alto, California: Annual Reviews, Inc.] **1097**

A discussion of the morphological, immunological and pathogenic relationships between the viruses of pox diseases of human beings and animals.—R.M.

SHCHERBATYCH, P. Y. & SIDORENKO, B. V. (1956). [Resistance of the dried virus of equine infectious encephalomyelitis to some physical factors.] — *Veterinariya, Moscow.* 33, No. 11, pp. 39-42. [In Russian.] **1098**

Dried brain suspensions, containing the virus of Russian equine encephalomyelitis and not more than 1% moisture, retained their virulence for 7 years when stored under a vacuum of 0·1-0·5 mm. Hg. In the absence of vacuum, the dried material was not virulent after 5 years. Freshly-prepared suspensions in 30% glycerol, stored in 1 or 2 ml. lots at 1° to 2°C., retained their virulence for a year, compared with 2-3 months in the case of suspensions diluted 1:20 or 1:40 with normal saline. Heating at 65° to 70°C. in a water bath destroyed fresh virus in 5 min. Dried virus resisted an oven temp. of 130°C. for 5 min., but was killed by 130°C. for 30 min. or 150°C. for 10 min. Ultra-violet light killed fresh virus, placed 85 cm. from the source, in 2 min. Dried virus was still alive after 5 hours' exposure, but was killed after 7 hours.—R.M.

LENNETTE, E. H., OTA, M. I., DOBBS, M. E. & BROWNE, A. S. (1956). Isolation of Western equine encephalomyelitis virus from naturally-infected squirrels in California. — *Amer. J. Hyg.* 64, 276-280. **1099**

Western equine encephalomyelitis virus was isolated from 3 tree squirrels (*Sciurus griseus*) and from 2 ground squirrels (*Citellus beecheyi*) out of a total of 121 squirrels tested. The 5 animals had shown abnormal and aggressive behaviour. It is considered that squirrels do not serve as a reservoir for this virus.

—M.G.G.

LENNETTE, E. H., WIENER, A., OTA, M. I., FUJIMOTO, F. Y. & HOFFMAN, M. N. (1956). Rapid identification of isolates of Western equine encephalomyelitis virus by the complement-fixation technique.—*Amer. J. Hyg.* **64**, 270-275. 1100

Chick embryos infected with Western equine encephalomyelitis virus contain a specific complement-fixing antigen. By inoculating chick embryos and using a c.f. test, the authors rapidly identified 242 out of 251 strains of this virus in infected mosquitoes.—M.G.G.

MUSSGAY, M. (1956). Hämaggglutination und Hämolyse durch einen eiadaptierten Stamm des Osttyps des amerikanischen Pferdeencephalitis-Virus. I. Untersuchungen über die Reaktionsbedingungen und einige Eigenschaften des Hämaggglutinins und Hämolymins. [Haemaggglutination and haemolysis by an egg-adapted strain of the Eastern type of the American equine encephalitis virus. I. Studies on the conditions of the reaction and on some characteristics of the haemaggglutinin and haemolysin.]—*Zbl. VetMed.* **3**, 328-340. [English, French and Spanish summaries.] 1101

M. described agglutination of fowl erythrocytes by an egg-adapted strain of Eastern equine encephalomyelitis virus. Haemaggglutinin was prepared from infected chick embryos by acetone-ether extraction. Optimal conditions for haemaggglutination were at 37°C. and a pH of 5.9-6.3. Titres were higher when sodium chloride-phosphate buffer concentration was high. Presence of the buffer also widened the pH range. The haemolysis optimum was at a pH of 6.0 and at 44° to 50°C. Haemaggglutination, but not haemolysis, took place in supernatant fluid obtained by protamine precipitation from virus-positive embryonic homogenates.

—E.G.

GINDIN, A. P., OGRENKO, N. M., LYUTIKOVA, O. G. & STATKEVICH, I. A. (1956). [Siderocytes in the peripheral blood in equine infectious anaemia.]—*Bull. Biol. Med. exp. U.R.S.S.* **42**, No. 9. pp. 20-21. [In Russian.] 1102

Siderocytes were not present in the blood of 30 normal horses nor of 26 horses which had been heavily bled for obtaining serum.

Siderocytes were present in the blood of all of 10 infected horses 4-10 days after the onset of fever, and 17 out of 22 horses with chronic equine infectious anaemia. It was considered that this was of diagnostic value. [See also *V.B.* **25**, 1987.]—R.M.

MACKINNON, M. M. & LE SOUEF, D. H. (1956). Bovine malignant catarrhal fever in New Zealand.—*N. Z. vet. J.* **4**, 86-90. [Authors' summary modified.] 1103

The first suspected occurrence of bovine malignant catarrh in New Zealand is recorded. The clinical and pathological features were identical with those described in other countries. The characteristic histological findings are given. The authors discussed briefly the distribution of the disease, so far as this is known, in New Zealand, its epidemiology, and the variation of clinical symptoms.

MACKINNON, M. M. (1956). Malignant catarrhal fever of bovines.—*N. Z. vet. J.* **4**, 91-96. [Abst. from author's summary.] 1104

Using literature mainly by workers in Africa and North America, M. described the clinical syndrome, differential diagnosis, P.M. findings, and histopathology of bovine malignant catarrh. Some variation in the observations of workers in Africa and North America were pointed out.

MADIN, S. H., YORK, C. J. & MCKERCHER, D. G. (1956). Isolation of the infectious bovine rhinotracheitis virus.—*Science.* **124**, 721-722. 1105

The causative agent of the influenza-like disease prevalent amongst cattle in California since 1953, and in Colorado since 1951, was isolated from the nasal washings and scrapings of infected animals in tissue cultures of bovine embryonic kidney. It was not a pleuropneumonia-like organism; it passed through a fine sintered glass filter, and survived storage at -70°C. for 7 months and at 37°C. for 96 hours.—A. ACKROYD.

GRINER, L. A., JENSEN, R. & BROWN, W. W. (1956). Infectious embolic meningo-encephalitis in cattle.—*J. Amer. vet. med. Ass.* **129**, 417-421. 1106

The clinical symptoms of 36 affected cattle aged 1-2 years were blindness, incoordination, depression and convulsions; duration of symptoms varied from one day to 3 weeks. Gross lesions were observed in all areas of the brain and primary lesions were most frequent in the digestive, respiratory and cardiovascular systems; some cases appeared to have been the sequel to infectious rhinotracheitis and bronchopneumonia. Gram-positive cocci were the most frequently encountered organisms.—E.V.L.

PAARMANN, E. (1956). Ein Beitrag zur Diagnose der Schweinepest und zur Pathologie ihres Inkubationsstadiums. [Diagnosis of

swine fever and the pathology of the incubation period.]—*Dtsch. tierärztl. Wschr.* 63, 273-275.

1107

Of 45 apparently healthy store pigs killed during an outbreak of swine fever in a piggery, 24 were considered to have been in the incubation stage. Of these 17 had histo-lymphocytic infiltrations suggestive of swine fever in one or more organs. Incidence of lesions was highest in the liver and kidneys, but those in the adrenal glands and c.n.s. were of greater diagnostic importance. Data were given of electrophoretic examination of sera of all 45 pigs.—E.G.

SCHWARTE, L. H. (1956). Incidence of hog cholera in Iowa during the past year and studies made on current field problems.—*Vet. Med.* 51, 559-561.

1108

The incidence of swine fever in Iowa continued to fall during 1955-56. About 40% fewer pigs were vaccinated but instances of post-vaccination troubles were nearly twice those of the preceding year. Animals had been vaccinated with antiserum and virus, antiserum and modified virus, modified virus only, or inactivated virus only. Most of the strains isolated were of low pathogenicity. Diagnosis could usually be confirmed by immunity tests.

—M.G.G.

ANON. (1956). Moot questions about hog cholera.—*J. Amer. vet. med. Ass.* 128, 463-464.

1109

To discover whether or not vaccinal virus is the chief source of swine fever in the U.S.A., it is suggested that an eradication scheme should be set up in a test area where no live vaccine would be used.—M.G.G.

HECKE, F. (1956). Erfahrungen mit Schweinepestmultanimpfungen. [Simultaneous serum-vaccine immunization against swine fever.]—*Wien. tierärztl. Mschr.* 43, 780-795. [English, French and Italian summaries.]

1110

Statistical data were given on results of serum-vaccine immunization against swine fever, involving 17,221 pigs. Of these 2,529 were from piggeries where there had been no recent outbreaks. No complications ensued as the result of vaccination. Of 10,417 from another piggery, where there was a steady influx of young pigs for fattening, about 80 died after they had been vaccinated. Of 3,499 pigs from piggeries where there had been outbreaks of swine fever 265 died after vaccination, this figure including about 200 of 254 which had been vaccinated whilst in clinical stages of the

disease. Of their offspring 37% were either aborted or stillborn and 15% died within 8 weeks of birth.—E.G.

POUL, J. & RAMPON, R. (1956). A propos d'une "variante" marocaine du virus suipestique. [A Moroccan "variant" of swine fever virus.]—*Arch. Inst. Pasteur, Algér.* 34, 106-112.

1111

The authors continued the discussion on whether a virus isolated from an epidemic in pigs in Morocco in 1952 was a pneumonia or swine fever virus [see also *V.B.* 25, 105 & 2804]. They reported that 5 ml. of swine fever antiserum per kg. body wt. protected pigs experimentally infected with this virus provided that the serum was given not later than 89 hours after infection. They consider the virus to be a hypervirulent strain of swine fever virus. It is now being used for the production of swine fever antiserum; the donor pigs have not developed pneumonia.—M.G.G.

METHNER, U. (1956). Klinische Beobachtungen über die Hepatitis contagiosa canis (H.c.c.). [Clinical observations on canine virus hepatitis.]—*Tierärztl. Umsch.* 11, 402-406.

1112

Canine virus hepatitis was diagnosed in 4 dogs and suspected in 6 others on histological examination. Preliminary symptoms were vomiting, vomiting of blood, refusal to eat, and diarrhoea. Most cases were feverish with acute septicaemic and haemorrhagic diathesis. In the final 24 hours apathy and symptoms of collapse appeared. Serological tests are considered of little value on account of the high proportion of positive reactors among dogs reported in the literature.—M.G.G.

WECKER, E. & SCHÄFER, W. (1956). Einbau von radioaktivem Phosphor in das Virus der klassischen Geflügelpest. [Incorporation of radioactive phosphorus in the classical fowl plague virus.]—*Z. Naturf.* 11b, pp. 181-187. [In German.]

1113

Radioactive phosphorus became incorporated in the virus when it was added to tissue cultures of infected chick embryo cells. A radioactivity of 1,500 impulses/min. per haemagglutinating unit was obtained. About 21% of the isotope was incorporated in the ribonucleic acid of virus, and 65% in the phospholipids.—R.M.

HOFSTAD, M. S. (1956). Further studies on the evaluation of immunity in chickens vaccinated with formalin-inactivated Newcastle disease virus vaccine.—*Amer. J. vet. Res.* 17, 738-741. [Author's summary modified.]

1114

Measurement of immunity in fowls vaccinated twice with inactivated Newcastle disease virus vaccine was attempted by a potency test in which the challenge virus is titrated in both the vaccinated and the controls. The difference in titres between the vaccinated and the controls is an index of the degree of immunity. The intranasal, intramuscular, and aerosol methods of challenge were employed. Infection in the titrations was based on recovery of virus from the blood at 96 hours after challenge. After this, the controls were destroyed and the vaccinated birds observed for an additional 10 days. After intranasal challenge, the infective titre of the virus in the vaccinated birds was about 10, while in the controls it was 10^6 . Thus the vaccinated birds were able to withstand 10^5 chicken-infective doses by the intranasal route. After intramuscular challenge, the virus-infective titre in the controls was $10^{8.5}$; however, in the vaccinated birds the titre could not be determined. The aerosol exposure resulted in a titre of $10^{5.4}$ in the controls, while in the vaccinated it was estimated to be 10. None of the vaccinated birds in the three groups became clinically ill or died in the 10-day observation period after challenge. A substantial antibody titre was demonstrable by both the serum-neutralization and the haemagglutination-inhibition tests.

RICHTER, J. H. M. (1956). Een gekombineerde enting tegen kippenpokken en pseudo-vogelpest. [Combined inoculation against fowl pox and Newcastle disease.] — *Tijdschr. Diergeneesk.* 81, 763-767. [In Dutch. English, French and German summaries.]

1115

Inoculation into feather follicles of the Roakin strain of Newcastle disease virus combined with pigeon pox virus conferred a good immunity against Newcastle disease and fowl pox for at least a year. The inflammatory reaction in inoculated follicles commenced at the 2nd day, 2 days earlier than after inoculation of the pox virus alone.—R.M.

KOKERNOT, R. H., SMITHBURN, K. C. & WEINBREN, M. P. (1956). Neutralizing antibodies to arthropod-borne viruses in human beings and animals in the Union of South Africa.—*J. Immunol.* 77, 313-323.

1116

Of 168 samples of sera from cattle, sheep, goats, horses and fowls on a farm near Johannesburg, 28 (not specified) were positive for West Nile virus, and 4 out of 148 were positive for Sindbis virus.—M.G.G.

SLONIM, D. (1956). Beitrag zur Frage der antigenen Verwandtschaft des Virus der

tschechoslowakischen Zeckenencephalitis zu dem Louping-ill Virus und dem Virus der russischen Frühling-Sommer Encephalitis des östlichen Typus. [Antigenic relationships between the viruses of louping-ill, Czechoslovakian tick encephalitis and Russian spring-summer encephalitis.] — *Zbl. Bakt. I. Orig.* 167, 201-209. [English, French and Russian summaries.]

1117

S. demonstrated antigenic differences between these 3 viruses, using hamster immune serum prepared by means of a virus with a low number of passages in mice. The Czechoslovakian virus appeared to be more closely related to the Russian virus than to the louping-ill virus. It is considered that the group of viruses transmitted by ixodid ticks consists of 3 types.—M.G.G.

ROSS, R. W. (1956). A laboratory technique for studying the insect transmission of animal viruses, employing a bat-wing membrane, demonstrated with two African viruses.—*J. Hyg., Camb.* 54, 192-200.

1118

R. described a technique for demonstrating the transmission of human diseases by insects, in cases where no highly susceptible animal species is available. Tubes containing a suspension of infected baby mouse brain and fresh packed rabbit r.b.c. are warmed and sealed with pieces of bat-wing membrane. The tubes are inverted and mosquitoes allowed to feed through the membrane. After appropriate incubation, the engorged mosquitoes are given fresh tubes containing warmed normal serum and 1% blood cells. Fluid from these tubes is used for titration and intracerebral inoculation into mice. In one trial 29 out of 30 mosquitoes became infected, and 6 out of 24 transmitted virus from one to four times each.—M.G.G.

LUOTO, L. (1956). A capillary-tube test for antibody against *Coxiella burnetii* in human, guinea pig, and sheep sera.—*J. Immunol.* 77, 294-298. [Author's summary modified.]

1119

The capillary-tube test, using a stained antigen, was performed with undiluted human, g. pig, and sheep sera to detect antibody against *Rickettsia burnetii*. Titrations were carried out in saline soln. containing fresh normal bovine serum. Results were specific and readily reproduced. Because undiluted sera can be tested, lower levels of antibody were detected by this test than by the c.f. test; however, the titres of sera containing more than a trace of antibody were essentially equal by both methods.

The simplicity of the technique permits rapid testing of sera without elaborate laboratory facilities.

STERKHOVA, N. N. & MIRZOEVA, N. M. (1956). [Q fever in the Azerbaijan S.S.R.]—J. Microbiol., Moscow. 27, No. 12. pp. 84-88. [In Russian.] 1120

A serological survey revealed for the first time the presence of Q fever in Azerbaijan. Sera from 28 out of 289 cows and 15 out of 65 sheep reacted to the c.f. test. Sera from 473 out of 972 cows, 65 out of 282 sheep, and 7 out of 16 buffaloes reacted to the agglutination test. The organism was detected in *Hyalomma plumbeum* by g. pig inoculation.—R.M.

KULAGIN, S. M. & SOKOLOVA, N. F. (1956). [Disinfection of objects contaminated with *Rickettsia burneti*.]—J. Microbiol., Moscow. 27, No. 11. pp. 43-44. [In Russian.] 1121

For byre disinfection following the abortion of a cow from Q fever, 10-20% soln. of bleaching powder was recommended. Implements used to clean the stall were immersed in 5% phenol soln. for an hour. Clothing was soaked in 1% lye or 2% soda soln. and then boiled for 30 min. Rubber boots, aprons and gloves were carefully washed in 5% phenol soln. or 3% chloramine soln. Hands were immersed in 2% chloramine soln. or a 2-5% water-glycerol

soln. of hexyl- and heptylresorcins for 5 min. and then washed with soap and water. The carcass of an infected cow was cut up into pieces not larger than 8 cm. or 2 kg. and boiled for 2½ hours in an open vessel or 2 hours in a closed vessel at a pressure of 1½ atmospheres. The blood and viscera were destroyed.

—R.M.

ENRIGHT, J. B., SADLER, W. W. & THOMAS, R. C. (1956). Observations on the thermal inactivation of the organism of Q fever in milk.—J. Milk Tech. 19, 313-318. 1122

Pasteurization of cows' milk at 143°F. for 30 min. was inadequate, but 145°F. for 30 min. or 161°F. for 15 sec. destroyed *Rickettsia burneti*.—E.V.L.

STOKER, M. G. P., SMITH, K. M. & FISSET, P. (1956). Internal structure of *Rickettsia burnetii* as shown by electron microscopy of thin sections.—J. gen. Microbiol. 15, 632-635. [Authors' summary slightly modified.] 1123

Thin sections of purified suspensions of *R. burnetii* were examined by electron microscopy. The organism possesses a limiting membrane, within which lie a granular region and a dense central body. The configuration of the central body suggests that it may consist of an elongated and irregularly twisted strand.

See also absts. 1000 (bacteriophage typing of *E. coli*); 1201 (diseases of animals in Surinam).

IMMUNITY

STAUB, H. & BOGUTH, W. (1956). Gamma-Globulin- und Antikörperbildung im Säuglingsalter beim Schwein. [Production of gamma-globulin and antibodies in the piglet.]—Zbl. VetMed. 3, 653-661. [English, French and Spanish summaries. English summary modified.] 1124

At birth pigs are without γ -globulin but acquire it within a few hours, the amount depending on intake of colostrum. The level falls steeply in the first 5 weeks and then rises again slowly, reaching the normal value at about 15 weeks. Piglets reared artificially for the first 3 days on a diet free from globulin have no γ -globulin in their serum at first, but an increasing amount appears from the second week. At 8 weeks the level is the same as in naturally reared piglets.

Piglets receiving no colostrum for 3 days after birth and then suckled by the sow, those given free access to colostrum, and those given it for only half a day first show antibodies in their serum at 5 to 6 weeks, after parenteral

introduction of a bacterial antigen. Antibodies are not demonstrable until the 10th week in the serum of piglets reared entirely without sow's milk.

The large quantities of gamma-globulin passively transferred immediately after birth are not used at once for antibody formation. This process begins after the onset of γ -globulin synthesis and appears to be caused by certain substances in the milk.

STONE, W. H. (1956). The J substance of cattle. III. Seasonal variation of the naturally occurring isoantibodies for the J substance.—J. Immunol. 77, 369-376. [Author's summary modified.] 1125

Studies of the titres of naturally occurring anti-J sera in two groups of 8 and of 23 cows revealed that the concentration of anti-J varies considerably among individuals and for the same individual from one time to another. The rise and fall of anti-J levels in the first group during a period of 28 months and in the second group

during a period of 19 months was correlated with the season of the year. In both groups the highest titres were found during late summer and early autumn (August to October), and the lowest titres during late autumn and winter (December to March). The physiological basis for this striking seasonal variation is at present unknown.

See also absts. 977 (Micrococceus pyogenes vaccine); 980 (aluminum hydroxide anthrax vaccine); 987 (mycobacterial antigens); 992 (micro-complement fixation test in ovine Johne's disease); 999 (post-vaccination shock in calves following use of *pasteurella* (pneumonia) vaccine); 1012-1017 (brucellosis); 1027-1028 & 1033-1034 (leptospirosis); 1061 (duration of immunity in cattle following vaccination with egg-adapted pleuropneumonia vaccine); 1063 (freeze-agglutination in avian chronic respiratory disease); 1069 (complement fixation reaction with *H. muris* and *E. coccoides* in mice); 1070 (survey of Russian literature); 1084 (toxoplasmosis); 1087 (F. & M. disease); 1092-1093 (rabies); 1095 (sheep pox); 1096 (ring-zone formation in animal tissues following infection with viruses); 1100-1101 (equine encephalomyelitis); 1114 (Newcastle disease); 1115 (combined vaccination against Newcastle disease and fowl pox); 1116 (antibodies to arthropod-borne viruses in South Africa); 1117 (antigenic differences between louping-ill, Czechoslovakian tick encephalitis and spring-summer encephalitis); 1119-1120 (Q fever); 1147-1149 (syngamosis); 1151 (hookworms).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

I. CRAGG, J. B. (1956). The olfactory behaviour of *Lucilia* species (Diptera) under natural conditions.—*Ann. appl. Biol.* 44, 467-477. **1127**

II. CRAGG, J. B. & COLE, P. (1956). Laboratory studies on the chemosensory reactions of blowflies.—*Ibid.* 478-491. **1128**

I. A certain factor in the wool of sheep was found to be of great importance in the attraction of female *Lucilia sericata*. This wool factor could not be replaced by ammonium or other substances. Ammonium carbonate-indole with wool attracted *L. sericata* strongly, but *L. caesar* and *L. illustris* only moderately. The latter were more responsive to sulphhydryl, alone or with wool. C. discussed the role of environmental temp. on oviposition. The fact that the blowflies did not lay eggs on wool kept moist and incubated at 38°C. for 3 weeks was regarded as evidence that bacteria normally present on wool have no effect on the susceptibility of sheep to blowfly strike.

II. The wool factor resisted storage and was not completely destroyed by washing of the wool. It attracted female blowflies, particularly fertilized ones which had daily access to meat, but not males. *L. sericata* and *L. cuprina* deprived of their antennae, the main seat of the olfactory sense, still retained a certain ability to respond, provided the floor of the laboratory was kept damp.—E.G.

WEITZ, B. & GLASGOW, J. P. (1956). The natural hosts of some species of *Glossina* in East Africa.—*Trans. R. Soc. trop. Med. Hyg.* 50, 593-612. [Authors' summary modified.] **1129**

The natural hosts of 7 species of *Glossina* were studied by the identification of blood ingested by 1,433 flies caught in different areas. The precipitin test and the agglutination-inhi-

bition test were used. *G. morsitans*, *G. swynnertonii* and *G. austeni* derived about half their sustenance from pigs. *G. palpalis* fed mainly on reptiles and birds, and *G. pallidipes* on bush-buck. *G. brevipalpis* fed chiefly on hippopotamus in an area from which the game had been partially eliminated. A few specimens from *G. longipennis* were exclusively rhinoceros blood. No flies had fed on hartebeest, zebra or topi, and very few had fed on impala, which were very numerous in some areas.

NORRIS, K. R. (1956). Commonwealth Scientific and Industrial Research Organisation research on cattle tick.—*Aust. vet. J.* 32, 177-182. **1130**

An account is given of the research carried out by the Division of Entomology, C.S.I.R.O., on the control of *Boophilus microplus*. Attention has been given to arsenic, the chlorinated hydrocarbons and the organic phosphorus compounds as acaricides and it is concluded that D.D.T. is by far the safest chemical to use in dipping baths. The pattern of resistance by ticks to insecticides closely parallels that reported for the house-fly. Trials with systemic application of D.D.T., Lindane, Aldrin, and Dieldrin are reported.

N. summarized information on the biology and ecology of the tick and stressed how this has been used to improve the efficiency of insecticides and of control by pasture management.

—F. H. S. ROBERTS.

MULHEARN, C. R. (1956). Control of cattle tick infestation in Queensland.—*Aust. vet. J.* 32, 183-187. **1131**

M. discussed the importance, distribution and control of *Boophilus microplus* in Queensland. There are about 4,000 cattle dips in use, and about half are still charged with arsenic,

but where arsenic resistance has occurred D.D.T., benzene hexachloride and toxaphene are used. There are 50 dips under Government supervision. These use D.D.T. and are located at strategic points along stock routes to cleanse cattle moving into lightly infested and tick free areas. Application by mechanical sprays is not considered as effective as by dipping, but may have to be employed if resistance to the chlorinated hydrocarbon insecticides increases in importance, and if control has to be undertaken with organic phosphorus compounds.

—F. H. S. ROBERTS.

BLUMER, C. C. (1956). Some aspects of the cattle tick problem in New South Wales.—*Aust. vet. J.* **32**, 188-193. **1132**

In N.S.W. the policy of the Government towards *Boophilus microplus* is one of total eradication. 5,000 sq. miles have been cleared since the campaign began in 1932. Arsenic was used up to 1952, when arsenic resistance was encountered. Dipping baths are now charged with D.D.T. Eradication campaigns in any district commence in January and the cattle are dipped at intervals of 14 days for 15 months. The behaviour of D.D.T. in the dipping bath and its storage in the animal's body and excretion in milk are discussed.—F. H. S. ROBERTS.

LEGG, J. (1956). Insecticides in the control of cattle tick infestation.—*Aust. vet. J.* **32**, 194-198. **1133**

Arsenic was used in Queensland for the control of *B. microplus*, until 1941, since when arsenic resistance has become widespread. D.D.T., benzene hexachloride, chlordane, dieldrin, aldrin, T.T.C. [V.B. **24**, 2805], and some organic phosphorus compounds are discussed in relation to degree of acaricidal efficiency and toxicity to cattle. D.D.T. is considered the best where arsenic resistance is present. Insecticide resistance by ticks was discussed briefly: L. considered that trials with organic phosphorus compounds delivered by power spray are worth considering for control and eradication.

—F. H. S. ROBERTS.

GRAHAM, N. P. H. (1956). Opening of discussion on paper on insecticides in the control of cattle tick infestation.—*Aust. vet. J.* **32**, 198-203. **1134**

G. discussed the various problems associ-

ated with the use of insecticides in dipping baths for the control of *B. microplus*. Knowledge is required on the stability of the insecticide formulation, an accurate sampling technique for tick populations to assess acaricidal efficiency, the most effective intervals between treatments, and resistance of ticks to insecticides. G. emphasized that management is the most important part of tick control and that good control depends not so much on the insecticide used but on how it is used.—F. H. S. ROBERTS.

RIEK, R. F. (1956). Factors influencing the susceptibility of cattle to tick infestation.—*Aust. vet. J.* **32**, 204-209. **1135**

Some cattle, despite exposure to heavy infestations of *Boophilus microplus*, carry very few ticks. R. considers that in British breeds this resistance is a hypersensitivity phenomenon which affects mainly the larvae and nymphae. There is evidence that the mast cell in the dermis plays an important role in the hypersensitivity reaction. In laboratory and field observations zebu cattle were significantly more resistant to infestation than British cattle. R. considers that resistance in the former breed is due not only to a hypersensitivity, but possibly also to an immune reaction developed in the skin.

—F. H. S. ROBERTS.

BOLLE, W. R. (1956). Neguvon ein äusserlich und innerlich anwendbares Insektizid, Larvizid und Acarizid. [“Neguvon”, (o, o-Dimethyl-2, 2, 2-trichlorethyl phosphonate), a larvicide and ascaricide for internal and external application.]—*Vet. -med. Nachr.* No. 3, pp. 155-172. **1136**

The literature describing trials with this preparation, also known as L 13/59 and ‘Dipterex’, is reviewed. It is eliminated from the body more quickly than other organic phosphorus compounds. The period of cholinesterase inhibition is therefore short. Cases of toxicity can be treated with atropine. It has possibilities as a systemic parasiticide given internally; unfortunately its effect is brief and the doses required may give rise to symptoms of toxicity. A 0.5% aqueous solution is recommended as a spray or wash for controlling ectoparasites on domestic animals; for 100% control of warbles a 2% aq. soln. is recommended, a second application being given 8 weeks later.—M.G.G.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

THOM, K. -L. (1956). *Fasciola hepatica* als Ursache einer Endometritis des Rindes. [Fasciola hepatica as the cause of endometritis in cattle.]—*Dtsch. tierärztl. Wschr.* 63, 389-390.

1137

F. hepatica eggs, young and one adult fluke were found in the reddish-brown uterine secretion of 5 sterile cows. It is suggested that larvae reached the uterus via the blood stream.

—M.G.G.

WARD, J. W. & BRADSHAW, R. C. (1956). New records of the occurrence of the hydatid tapeworm, *Echinococcus granulosus*, in Central and South Mississippi.—*J. Parasit.* 42, No. 4, -Sect. 2. (Suppl.) p. 35.

1138

Echinococcus cysts of the unilocular type were found in the livers of 348 of 8,066 pigs, and 10 of 800 cattle. The adult stage was recovered from the intestine of one of 65 dogs. No cysts were found in 1,157 pigs from Missouri.

—M.G.G.

YAMASHITA, J. (1956). Studies on echinococcosis. II. Echinococcosis in Japan.—*Jap. J. vet. Res.* 4, 64-74. [In English.]

1139

Of the 70 recorded cases of hydatid cysts in Japan, 25 have occurred in Rebun Island. The infection there is harboured by stray dogs and wild foxes. Eradication measures include hygiene, propaganda and the treatment of stream waters which are used for domestic purposes.—A. SEAMAN.

ABDOU, A. H. (1956). Observations on the life cycle of *Davainea proglottina* in Britain.—*J. Helminth.* 30, 189-202. [Abst. from author's summary and conclusions.]

1140

Studies on the different species of slugs in Great Britain were carried out under natural conditions and a simple method of distinguishing the species is presented. The common field or grey slug (*Agriolimax reticulatus*) and the garden slug (*Arion hortensis*) seem to be the most important intermediate hosts for *D. proglottina* in G. Britain. Slugs of nearly every age of these two species were experimentally exposed to infection with almost 100% positive results. These two are the most prevalent and widely distributed species of slugs in this country. This and the wet damp climate favour the propagation of the tapeworm.

KAGAN, I. G. & BARGAI, U. (1956). Studies on the serology of trichinosis with hemagglutination, agar diffusion tests and precipitin ring tests.—*J. Parasit.* 42, 237-245.

1141

Rabbits became positive to the haemagglu-

tination test described by Boyden [V.B. 21, 3620] 6-15 days after infection with *Trichinella spiralis*. The haemagglutination test was more sensitive than the precipitin ring test in detecting antibody early in infection. In the agar double diffusion tests three bands were seen in the serum of infected animals.—M.G.G.

I. SADUN, E. H., NORMAN, L. & BROOKE, M. M. (1956). The antibody response in rabbits to the intestinal and to the extra-intestinal phases of infections with *Trichinella spiralis*.—*J. Parasit.* 42, No. 4, -Sect. 2. (Suppl.) p. 17.

1142

II. SADUN, E. & NORMAN, L. (1956). The use of metabolic antigens in the flocculation test for studying the serological response of rabbits to graded infections with *Trichinella spiralis*.—*Ibid.* p. 17.

1143

I. Following experimental infection of rabbits with *T. spiralis* and determining the serological response by means of the flocculation and complement-fixation tests, it was found that the intestinal phase of infection alone stimulated low anti-larval antibody titres provided that more than one exposure took place, but a high antibody titre resulted from the extra-intestinal inoculation of larvae setting up muscle infection.

II. The sera obtained weekly from several groups of rabbits infected with doses from 500 to 400,000 larvae of *T. spiralis* were tested by the flocculation reaction using metabolic [enzyme-extracted] and purified somatic larval antigens. With both antigens the time of the first detectable antibody response was inversely related to size of the infective dose and varied from 1 to 7 weeks. No false positive reactions were obtained with negative control sera, and although the two antigens gave similar results the metabolic antigen appeared to give greater sensitivity.

—W. E. PARISH.

COKER, C. M. (1956). Effects of cortisone on cellular inflammation in the musculature of mice given one infection with *Trichinella spiralis*.—*J. Parasit.* 42, 479-484. [Author's summary modified.]

1144

Daily treatment of mice with cortisone for 30 days after infection with *T. spiralis* almost completely suppressed normal cellular infiltration into the musculature in response to invading larvae. Mice treated for 13 days after infection, however, developed a striking general myositis, but there was no reduction in the number of larvae recovered from the musculature. There-

fore, if this response is related to an immune action against the larvae, it takes longer than 30 days to produce demonstrable effects.

KORNIENKO, Z. P., TENDETNIK, Y. Y. & CHARYEV, O. C. (1956). [Use of the fungus *Arthrobotrys oligospora* for killing strongyle larvae in horse faeces.] — *Veterinariya, Moscow*. 33, No. 11. p. 74. [In Russian.]

1145

In lab. tests the fungus was mixed at a conc. of 0·5-5% by weight with 230 samples each of 20 g. faeces from 4 horses heavily infested with strongyles. There were 22-407 times fewer larvae in treated faeces than in non-treated faeces, the maximum effect occurring 12-18 days after adding the fungus. Best results were obtained with samples kept at 16° to 17°C. and a relative humidity of 60-70%, but the fungus was active over a wide range of temp. and humidity. It was suggested that mixing the fungus with faeces would be a valuable aid to the control of equine strongylosis. A fungus of the genus *Nematoctonus* was also active against strongyle larvae, but to a lesser degree.—R.M.

WEINSTEIN, P. P. & JONES, M. F. (1956). The *in vitro* cultivation of *Nippostrongylus muris* to the adult stage.—*J. Parasit.* 42, 215-236.

1146

The development *in vitro* of *N. muris* to the adult stage is reported, in a medium consisting of caseinate, liver extract, rat serum and chick embryo extract. The adult worms were stunted but morphologically normal. Mating did not occur, probably because of the small numbers of adults obtained.—M.G.G.

I. SHIKHOBALOVA, N. P. (1956). [Immunity in chicks, acquired as a result of infection with *Syngamus*.]—*Trud. gel'mint. Lab.* 8, 248-258. [In Russian.]

1147

II. SHIKHOBALOVA, N. P. (1956). Demonstration of precipitins in the blood of chicks infected with *Syngamus skrjabinomorpha*.]—*Ibid.* 259-266. [In Russian.]

1148

III. SHIKHOBALOVA, N. P. & RUIZHIKOV, K. M. (1956). [Biology of *Syngamus skrjabinomorpha* Ryjikov (Ruizhikov), 1948.]—*Ibid.* 267-277. [In Russian.]

1149

I. As a result of infection of chicks with *Syngamus skrjabinomorpha* an immunity developed which after repeated infection was manifested by a decrease in the number of developing worms (compared with non-immune control birds), discharge from the trachea of worms in

various stages of development, delay in the development of the worms and some decrease in their size. Parasites often commenced development in the immune host, but abandoned the host before attaining maturity. In birds in which adult worms were absent, there may have been larval forms which could cause a larval infection, difficult to diagnose. Strength of the immunity depended on the intensity of the first infection. These observations were stated to apply equally to *S. trachea*.

II. Diluted or undiluted serum from chicks, infected with eggs of *S. skrjabinomorpha* 10 days previously, formed precipitates around living larvae of the nematode. Precipitins persisted in the serum for at least 3 months. Formation of precipitins was more active after multiple than after single infections.

III. A full account, with diagrams, of the morphology and life-cycle of *S. skrjabinomorpha*, first identified in fowls and geese in Georgia, U.S.S.R. It was said to be easily distinguishable from *S. trachea* by having 6 teeth in the buccal capsule, compared with the latter's 8, and by the fact that it infested geese. Development of larvae to the infective stage took 8-9 days at 27°C. or 18-20 days at 18° to 23°C. Females started laying eggs 18 days after infection of the host, and continued for about 2½ months. During the early stages of infestation adult worms occupied the lower part of the trachea, but after the 18th day they occurred in the upper part.—R.M.

ALICATA, J. E. & KOSHI, J. H. (1956). Stability of phenothiazine in cane molasses in the control of gastro-intestinal nematodes of cattle.—*J. Parasit.* 42, No. 4. -Sect. 2. (Suppl.) p. 19.

1150

Phenothiazine was mixed with molasses so that 20 ml. of the mixture contained 2 g. of phenothiazine. After storage for one or two months the preparation was given in gelatin capsules to 6 infected heifers. Faecal counts in these and in 2 control heifers receiving phenothiazine without molasses revealed that the drug had not lost its efficiency.—M.G.G.

THORSON, R. E. (1956). The stimulation of acquired immunity in dogs by injections of extracts of the oesophagus of adult hookworms.—*J. Parasit.* 42, 501-504. [Author's summary modified.]

1151

Physiological saline extracts of the oesophagi of adults of *Ancylostoma caninum* which contain substances with proteolytic activity were injected s/c into 4 puppies. The hookworms of

a challenge infection were fewer and smaller in these puppies than those in 3 untreated puppies.

IVASHKOV, I. S. (1956). [Trials with chlorophos against ascarids in horses.]—*Veterinariya, Moscow*. 33, No. 10. pp. 51-52. [In Russian.] 1152

Chlorophos is *O,O* dimethyl-2,2,2-trichlor-1-oxyethylphosphonate. Trials with 16 horses indicated that it was safe and effective against ascarids, when given as a 2-5% aqueous soln. by stomach tube at a dosage of 15 mg./kg. body wt. Neither this nor double the dosage caused any ill effects in the treated horses.—R.M.

WYKOFF, D. E. & ALTMANN, S. A. (1956). Ovicidal activity of certain compounds on the embryonated eggs of *Ascaris lumbricoides*.—*J. Parasit.* 42, 504. 1153

In repeated tests 4-thiocyanato-*o*-cresol, 4-thiocyanato-*m*-cresol, 4-thiocyanato-*o*-ethylphenol, 4-thiocyanato-2,6-xylenol, 4-thiocyanato-3,5-xylenol, and acridine, at dilutions of 1:10,000, killed at least 80% of *A. lumbricoides* eggs in the vermiciform stage. Single tests with copper acetonyl acetone, methylchloride, dio-*o*-tolyl thiourea, and cincophane, gave similar results at the same concentration. Single tests with higher dilutions of the 4-thiocyanato compounds gave irregular results. 4-Thiocyanato-*o*-cresol at 1:100,000 killed 73% of the eggs but at 1:200,000 it had no effect.—M.G.G.

EHRENFORD, F. A. (1956). Canine ascariasis—a potential zoonosis.—*J. Parasit.* 42, No. 4. -Sect. 2. (Suppl.) pp. 12-13. 1154

Faecal examination in 1,465 dogs for a period of 26 months revealed that the incidence of worm infestation was 21% for *Toxocara canis* and 4.1% for *Toxascaris leonina*. *Toxocara cati* was found only rarely. The incidence of *T. canis* infestation was much higher in male than in female dogs. Females developed increasing immunity from 6 to 36 months of age. Males did not show this tendency, and their incidence of infestation varied seasonally, the highest incidence being during the winter months. The findings support the contention that *T. canis* is the principal agent in human visceral larva migrans.—M.G.G.

WALLACE, W. S., HEWITT, R. I., TAYLOR, L. H., JR. & WALETZKY, E. (1956). Effects against dog ascarids of low daily doses of Caricide in the feed.—*J. Parasit.* 42, No. 4. -Sect. 2. (Suppl.) p. 12. 1155

Daily oral doses of diethylcarbamazine acid citrate as low as 2 mg./kg. body wt. eliminated

within 3 to 5 days the majority of *Toxocara canis* from naturally infected puppies. Daily doses of 5 mg./kg. interfered with the development of experimental *T. canis* and *Toxascaris leonina* infections; eosinophilia developed, but no worms were found during the experiment or at P.M. examination. No symptoms of toxicity were observed in puppies given 2 mg./kg. of the drug daily for periods of up to 15 weeks.

—M.G.G.

SHUMARD, R. F. (1956). The anthelmintic activity of powdered and liquid Parvex against *Ascaridia galli* and *Heterakis gallinae*.—*J. Parasit.* 42, No. 4. -Sect. 2. (Suppl.) p. 13. 1156

Trials with liquid and powdered piperazine-1-carbodithioic betaine given to experimentally infected fowls indicated that both forms of the drug control *A. galli* at dosages as low as 75 mg./kg. body wt., but are not effective against *H. gallinae* at dosages as high as 225 mg./kg. A single dose of 11,648 mg./kg. of the powdered product was not acutely toxic for fowls.—M.G.G.

KARTMAN, L. (1956). Notes on the encapsulation of *Dirofilaria immitis* in the mosquito *Aedes aegypti*.—*Amer. J. vet. Res.* 17, 810-812. 1157

Female mosquitoes were fed upon a dog infested with *D. immitis* and were dissected in batches daily for 20 days. Encapsulated microfilariae were present from the 3rd day onwards, mainly in the malpighian tubules; a few were found in the haemocoel from the 14th day onwards; they were rarely present in the midgut. Encapsulated "sausage stage" larvae were occasionally found from the 8th day. The incidence of encapsulated forms increased with time. It is suggested that encapsulation may be a reaction to an unfavourable host environment.

—F.E.W.

NEWTON, W. L. & WRIGHT, W. H. (1956). The occurrence of a dog filariid other than *Dirofilaria immitis* in the United States.—*J. Parasit.* 42, 246-258. 1158

Unidentified microfilariae have been recovered from the peripheral blood and 5 adult filariids from the s/c tissue of dogs in the eastern States of the U.S.A. Preliminary observations indicate that the parasite is a species of *Dipetalonema*, perhaps *D. reconditum*.—M.G.G.

MADSEN, D. E., DISSAMARN, R. & CHOMANAN, T. (1956). Microfilaria in elephants.—*J. Parasit.* 42, 552. 1159

Since 1945, microfilariae have frequently been observed in the circulating blood of elephants in Thailand. Adult filariae have been reported in the heart chamber and a single adult

has been recovered from the subcutaneous abdominal region. In a study of 27 elephants, 21 were found to have microfilariae in the blood.

—M.G.G.

See also *absts.* 1201 (diseases of animals in Surinam); 1319 (Mönnig's parasitology).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

NILSSON, A. (1956). A case of metastasising tumour of the glomus aorticus in a dog.—*Nord. VetMed.* 8, 875-881. [In English. German and Swedish summaries. Abst. from author's summary.]

1160

An account of a tumour of the aortic body with metastasis to the gall-bladder and neighbouring parts of the liver. It was of the peritheliomatous type (perivascular sarcoma). N. stated that this was the first recorded case with distant metastasis in an animal.

NUTRITIONAL AND METABOLIC DISORDERS

ALEXANDER, G. (1956). Influence of nutrition upon duration of gestation in sheep.—*Nature, Lond.* 178, 1058-1059.

1161

The mean duration of pregnancy of ewes fed a low protein diet from the 108th, 129th, 136th, or 143rd day to parturition was shorter by 0·7-5 days than that of comparable groups fed a high protein diet. Parturition was hastened more by undernutrition in the ewes which bore twins than in those that bore single lambs, and where the foetus was older when underfeeding began (except when it began near to term).—A. ACKROYD.

SCHMIDT, W. (1956). Alimentäre Ursachen der Unfruchtbarkeit beim weiblichen Rinde und ihre Verhütung. [Alimentary causes of sterility in cows.]—*Mh. VetMed.* 11, 419-427.

1162

The alimentary causes of sterility in cows are starvation and an unbalanced diet. Sterility may be the direct result of inadequate food or may occur indirectly through lowered resistance to infection. In the winter months the diet of cows is often unbalanced and subjected to sudden changes. Beet tops and straw lead to a deficiency in Ca and P. Root vegetables and straw contain little protein and lack carotene. Silage and concentrates again promote mineral imbalance. Stored hay may lose its content of vitamin A. Molasses rapidly depletes an animal of Ca and must be balanced by lucerne, red clover, hay, and mineral supplements.—M.G.G.

RADISSON, J. J., SMITH, C. K. & WARD, G. M. (1956). The mode of action of antibiotics in the nutrition of the dairy calf. I. Effect of terramycin administered orally on the per-

formance and intestinal flora of young dairy calves.—*J. Dairy Sci.* 39, 1260-1267. [Authors' summary modified.]

1163

Three-day-old calves were used, 5 being given a daily supplement of terramycin, 1 mg./kg. body wt., and 10 controls kept on the same diet without terramycin for 9 weeks. In the test group the rate of wt. gain was 33% above that of the controls; appetite and feed efficiency were also increased. The incidence of scours, which was low, was unaffected by the treatment. Terramycin was detected in the faeces 6 to 9 hours after the first feeding. Terramycin was found in the faeces during continuous feeding, and also in the urine. There was no marked difference in total and coliform counts attributable to the feeding of terramycin. However, there was a significant decrease in the number of enteric streptococci in the test group. Antibiotic sensitivity assays indicated an increase in the number of resistant strains of coliforms and enteric streptococci in the faeces of calves fed terramycin. The normal metabolism of enteric streptococci appeared to be impaired by terramycin *in vivo* and *in vitro*. These bacteriological studies indicated that improved techniques should be used to determine the extent to which antibiotics affect the intestinal flora of animals.

WAHLSTROM, R. C. (1956). The effect of high level antibiotic supplementation during part or all of the growing-fattening period of swine.—*J. Anim. Sci.* 15, 1059-1066. 1164

W. studied the growth-promoting action of chlortetracycline or a 1:8 mixture of penicillin and streptomycin on fattening pigs. The action of chlortetracycline at a conc. of 100 g./ton of

food was slightly greater than its action at a conc. of 10 g./ton, but there was not much difference in action between 10 and 100 g./ton of the mixture of penicillin and streptomycin.

When pigs fed the "high levels" (i.e., 100 g. a ton) reached a body wt. of 100 lb., withdrawal of antibiotic reduced food intake and weight gain. If, instead, the conc. of antibiotic was reduced to 10 g. a ton, reduction in food intake and weight gain still occurred in the case of chlortetracycline, but not with the mixture of penicillin and streptomycin.—R.M.

KITTS, W. D. & WOOD, A. J. (1956). The effect of antibiotic feed supplementation on thyroid size and activity in the albino rat.—*Acta endocr. Copenhagen.* **23**, 407-412. [In English. Authors' summary modified.] **1165**

Oral administration of sodium penicillin G and aureomycin at doses of 10 and 100 mg./kg. of feed had no goitrogenic effect on the rats used. There was no apparent change in uptake of radioactive iodine by the thyroid gland.

WILLIAMS, V. J. & CHRISTIAN, K. R. (1956). Rumen studies in sheep. II. A comparison between rumen microbial end-products in thrifty and ill-thrifty hoggets.—*N. Z. J. Sci. Tech. Sect. A.* **38**, 268-276. [Abst. from authors' summary.] **1166**

Six hoggets were placed on dairy pasture and 6 on sheep pasture. Those on the dairy farm grew well, while those on the sheep farm were unthrifty and had poor appetites. Internal parasites and rickets were excluded as causes of ill-thrift. There were small but significant differences between the groups in the ruminal concentrations of volatile fatty acids and ammonia. The ratio of acetic to propionic acid was lower in the dairy-farm group. Levels of protein nitrogen were considerably lower in the unthrifty sheep. No gross differences in ruminal micro-organisms were observed.

THOMAS, W. E. (1956). Penicillin as a preventive of bloat in the field with concurrent laboratory studies on rumen contents.—*J. Anim. Sci.* **15**, 1295. **1167**

Oral administration of 100 mg. of procaine penicillin to cows on Ladino clover pasture prevented bloat after 12 and up to 96 hours later. Bloat developed in controls. Studies of the rumen contents of 8 fistulated cows showed that the specific gravity of the rumen contents of a treated animal increased from 0.46 to 0.93, and, instead of froth, an air pocket developed above the ingesta.—M.G.G.

JOHNSON, R. H., BROWN, L. R. & JACOBSON, N. L. (1956). The effects of a water-dispersible oil and of penicillin on characteristics of rumen ingesta and on bloat.—*J. Anim. Sci.* **15**, 1294. **1168**

Incidence and severity of bloat in 25 steers on lucerne pasture were reduced by a water-dispersible oil at 1% of the drinking water. The average surface tension value of the rumen ingesta of these animals was 63.7 dynes/cm., but during treatment 57.2 dynes/cm. Daily administration of 75 mg. of penicillin by capsule for 10 days appeared to reduce bloat in 15 dairy animals, but responses varied greatly. The average surface tension value of ingesta fell from 56.7 to 56 during treatment. Foam volume was slightly greater and foam stability slightly lower in the animals given penicillin.—M.G.G.

BIERI, J. G., FOX, M. R. S., POLLARD, C. J. & ORTIZ, L. O. (1956). Essential fatty acids in the chick. I. Development of fat deficiency.—*Proc. Soc. exp. Biol., N. Y.* **93**, 237-240. [Authors' summary modified.] **1169**

Day-old chicks reared on a purified diet containing approx. 0.046% fat grew normally for 6-8 weeks, after which weight gains began to decrease slightly. No marked symptoms of deficiency developed, but depigmentation of feathers and scaliness of skin were observed. The males had smaller testes and some of the females had immature oviducts. Water consumption did not increase markedly until the 11th week on the fat-free diet.

HALLANGER, L. E. & SCHULTZE, M. O. (1956). Development of fatty livers during lactation of rats fed amino acid rations.—*J. Nutr.* **60**, 25-33. [Authors' summary slightly modified.] **1170**

Rats fed protein-free amino-acid rations developed hypertrophied and severely fatty livers under the stress of lactation. After lactation the concentration of liver lipids decreased. When lactation was supported by an adequate diet some hypertrophy of the liver was observed, but the lipid content decreased.

NABER, E. C., CRAVENS, W. W., BAUMANN, C. A. & BIRD, H. R. (1956). The relation of dietary supplements and tissue metabolites to glycine toxicity in the chick.—*J. Nutr.* **60**, 75-85. [Authors' summary modified.] **1171**

Although symptoms of glycine toxicity in chicks were prevented by folacin, dietary glycine did not depress the folacin content of the tissues, nor did folacin depress the level of glycine in the blood. Liver glycogen was

depressed by glycine and increased by folacin; blood glucose, uric acid, calcium and *p*-hydroxyphenyl compounds were unaffected by either. Attempts to stimulate glycine toxicity by administration of possible metabolites including oxalic and glyoxylic acids were unsuccessful, and simultaneous feeding of glycine and formate did not alter the course of glycine toxicity. Feeding of methionine and arginine minimized the symptoms but did not restore growth. Serine was innocuous at levels equivalent to those of glycine that produced glycine toxicity. Tyrosine and alanine caused depression of growth which was not corrected by folacin. Preliminary evidence suggested that high levels of riboflavin might aggravate the symptoms of glycine toxicity.

CHAPMAN, H. L., JR. & DAVIS, G. K. (1956).

Evaluation of the liver biopsy technic for use in mineral nutrition studies with beef cattle.

J. Anim. Sci. **15**, 1231. 1172

The copper content of samples from each of 30 ox livers varied significantly according to site. There were no marked differences in iron content between samples. Analysis of blood and liver samples from 37 cattle deprived of copper indicated that the copper and iron content of the liver were of more value than the haemoglobin or total copper content of the blood in the prognosis of copper deficiency.

—M.G.G.

DENT, W. E., HOWELL, H. B., ADAMS, F. W. & MEHLIG, J. P. (1956). **Growth performance and blood and liver copper values in Hereford calves offered certain mineral elements free choice.**—*J. Anim. Sci.* **15**, 1103-1111. 1173

In the coastal region of Oregon, dullness of the coat, scouring, emaciation, depression of appetite, and sometimes delayed oestrus were observed in Hereford cattle. Average copper content of the blood plasma was 0.574 p.p.m. and amounts in the liver varied from 2.6 to 21.4 p.p.m.; that of forage averaged 7 p.p.m. 10 calves were given the choice of 6 mineral mixtures composed of dicalcium phosphate, common salt, CoCO_3 + salt, CuSO_4 + salt, MgSO_4 + salt, and steamed bone flour, respectively. Over the experimental period of 4 months the animals consumed daily an average of 60 mg. MgSO_4 , 17.3 mg. CuSO_4 and 0.6 mg. CoCO_3 , but this intake had no lasting effect on the Cu content of the liver, which did not differ much from the controls which were given no

mineral supplement. These calves were not able to correct Cu deficiency by selection of a supplement containing copper.—R.M.

MAYO, R. H., HAUGE, S. M., PARKER, H. E., ANDREWS, F. N. & CARRICK, C. W. (1956).

Copper tolerance of young chickens.—*Poult. Sci.* **35**, 1156-1157. 1174

A diet of maize and soya bean oil meal containing 324 p.p.m. of copper caused muscular dystrophy and checked the growth of chicks at 4 weeks of age. In another trial a content of 520 p.p.m. decreased growth at 4 weeks of age, but at 8 weeks the males had an average weight equal to that of control chicks. When copper was included as copper-bound casein instead of copper sulphate there was a significant increase in growth but the incidence of muscular dystrophy remained the same.

—M.G.G.

SCAIFE, J. F. (1956). **Molybdenum excretion and retention in the sheep.**—*N. Z. J. Sci. Tech. Sect. A.* **38**, 293-298. [Author's summary modified.]

1175

Ammonium molybdate, dosed to sheep on a low-sulphate diet (chaffed oat hay), was largely accumulated in the body and was not excreted until a tissue degeneration involving sulphur catabolism occurred. The molybdenum appeared to be present in the blood as molybdate. Sheep receiving molybdenum on a diet adequate in sulphate (chaffed lucerne hay) excreted almost their entire intake of molybdenum, a large proportion being excreted in the urine apparently as molybdate. Renal molybdenum excretion was not related to diuretic activity, but was enhanced by administration of DL-methionine, sodium maleate, sodium fumarate, and phloridzin.

REID, B. L., KURNICK, A. A., SVACHA, R. L. & COUCH, J. R. (1956). **The effect of molybdenum on chick and poult growth.**—*Proc. Soc. exp. Biol., N. Y.* **93**, 245-248. [Authors' summary modified.]

1176

The results of two studies with chicks and one with turkey poult indicated that addition of molybdenum to purified basal diets resulted in a growth advantage of 13.5-19.1% over controls. The feeding of a reconstituted ash mixture which simulated the ash of distiller's dried solubles resulted in significant increases in growth rate of both chicks and poult. These findings would appear to indicate that chicks and poult need molybdenum in their diet.

ROMIJN, C. & VELTHUIZEN, J. (1956). **Die Jodausscheidung im Hühnerei.** [The excre-

tion of iodine in the hen's egg.]—*Arch. Geflügelk.* 20, 97-106. [English summary.]

1177

R. determined the iodine content in eggs of hens receiving iodine supplements of 0.37 mg./g. feed, which was considered a normal amount, and in hens receiving about 60 mg./kg. feed, given in the form of algal meal or potassium iodide supplements. Eggs from hens receiving the normal dose contained about 33% of the total iodine intake the remainder being excreted with the faeces. Eggs of those on the high iodine diet had a relatively much lower iodine content, amounting to only about 10% of the total intake. About 60% of the total iodine content of the egg was in the yolk. There were marked fluctuations in the iodine content of eggs from hens receiving supplements with their morning ration only. Breed and age appeared to influence iodine excretion to a certain extent. [See also *V.B.* 23, 3452.]—E.G.

ARNOLD, R. M. & BRAS, G. (1956). Observations on the morbid anatomy and histology of Manchester wasting disease of cattle in Jamaica, and related conditions in other countries of the Americas.—*Amer. J. vet. Res.* 17, 630-639. [Authors' summary slightly modified.]

1178

A detailed description is given of the histological changes found in Manchester wasting disease of cattle [*V.B.* 25, 159]. The essential pathological process is considered to be a form of metastatic calcification. On the basis of a comparison of the symptoms and gross and microscopic pathology, the condition is considered to represent the same syndrome as that known as "enteque seco" in South America and as "naalehu disease" in Hawaii.

I. DENT, C. E. (1956). Discussion on surgical aspects of disordered calcium metabolism. General aspects of calcium and phosphorus metabolism with especial reference to surgical problems.—*Proc. R. Soc. Med.* 49, 715-722.

1179

II. PYRAH, L. N. (1956). Discussion on surgical aspects of disordered calcium metabolism.—*Ibid.* 722-726.

1180

I. Factors which influence the dynamic equilibrium of calcium in the body and the plasma inorganic phosphorus levels are outlined and some of the signs and symptoms associated with disturbances of calcium metabolism are discussed.

II. Some of the conditions in which calcium salts are deposited in the renal paren-

chyma and renal passages in man are discussed. Excess calcium in the urine, occurring when the calcium intake is low, may indicate a disturbance of calcium metabolism.—A. ACKROYD.

KUIT, A. R. (1956). Een geval van vermoedelijk zinkgebrek (parakeratose) bij varkens, die gevoerd werden aan de droogvoerbak, [An outbreak of suspected zinc deficiency (parakeratosis) in pigs.]—*Tijdschr. Diergeneesk.* 81, 698-704. [In Dutch. English, French and German summaries.]

1181

Decrease in weight gain and dermatitis of the limbs was observed in young pigs fed a dry meal (composition stated) through a self-feeder. Affected pigs recovered, and the condition was prevented, when the meal was fed as a wet mash or when 0.02-0.04% crystalline zinc sulphate was added to meal fed dry.—R.M.

LEWIS, P. K., JR., HOEKSTRA, W. G., GRUMMER, R. H. & PHILLIPS, P. H. (1956). The effect of certain nutritional factors including calcium, phosphorus and zinc on parakeratosis in swine.—*J. Anim. Sci.* 15, 741-751.

1182

Further feeding experiments with pigs demonstrated that rations high in calcium hasten the onset and severity of parakeratosis. Supplements containing monosodium phosphate alleviated the skin condition but did not affect the loss of weight. Zinc as zinc sulphate fed at 50 p.p.m. in the food reduced the incidence and severity of the condition but did not completely prevent its onset, though at 100 p.p.m. it cured affected pigs. 500 p.p.m. zinc conferred no advantage over the 100 p.p.m. level. Injections of zinc (as $ZnSO_4 \cdot 7H_2O$) corrected the condition in affected pigs but caused marked reaction at the site of injection.—W. E. PARISH.

HOEKSTRA, W. G., LEWIS, P. K., JR., PHILLIPS, P. H. & GRUMMER, R. H. (1956). The relationship of parakeratosis, supplemental calcium and zinc to the zinc content of certain body components of swine.—*J. Anim. Sci.* 15, 752-764.

1183

In experiments on parakeratosis of pigs, supplements of zinc in the food had no effect on the zinc content of packed erythrocytes, spleen, intestine or pancreas, but increased the levels in the blood plasma, liver and kidney. The addition of 2% bone meal to the rations in the absence of a zinc supplement did not significantly alter the zinc content of the blood or body organs examined, but when 50 p.p.m. zinc and 2% bone meal was included in the food the zinc content of the liver and kidney

was decreased. The 2% bone meal did not significantly alter the pH of the alimentary tract, but zinc supplements appeared to lower slightly the pH of the contents of the large intestine.

—W. E. PARISH.

STEVENSON, J. W. & EARLE, I. P. (1956). **Studies on parakeratosis in swine.**—*J. Anim. Sci.* **15**, 1036-1045. 1184

In feeding tests with pigs, the initial levels for onset of parakeratosis were about 32 p.p.m. zinc and 0.48% calcium. In a diet containing 1% calcium the minimum zinc content preventing the condition was between 44 and 80 p.p.m. Examination of blood samples of small numbers of pigs fed varying levels of zinc and calcium showed that cases of parakeratosis may have lower levels than normal of haemoglobin, serum inorganic phosphorus and blood sugar.—W. E. PARISH.

LUECKE, R. W., HOEFER, J. A., BRAMMELL, W. S. & SCHMIDT, D. A. (1956). **Calcium and zinc in parakeratosis of swine.**—*J. Anim. Sci.* **15**, 1249. 1185

Pigs fed a diet containing 0.51% calcium and 0.61% phosphorus had a depressed growth rate and 40% incidence of parakeratosis. Other diets containing 1.21% Ca and 1.90% Ca each with 0.61% P severely depressed the growth rate and produced a 100% incidence of parakeratosis. The same diets with zinc supplements prevented the onset of the condition and zinc therapy alleviated the parakeratosis of the affected pigs.—W. E. PARISH.

NEWLAND, H. W., ULLREY, D. E., HOEFER, J. A. & LUECKE, R. W. (1956). **The relationship of dietary calcium to zinc metabolism in pigs.**—*J. Anim. Sci.* **15**, 1250-1251. 1186

A diet high in calcium, low in zinc (1.19% Ca and 33 p.p.m. Zn) consistently caused parakeratosis in weaned piglets under experimental conditions, but decreasing the calcium (0.64%) or raising the zinc content (94 p.p.m.) prevented the condition.

Pigs on the experimental diets were injected intravenously with Zn^{65} , and the endogenous faecal zinc was determined by the isotope dilution technique. Those pigs with parakeratosis had a higher daily level of excretion of endogenous zinc and Zn^{65} in the faeces, and had higher specific activities of both blood and faeces.—W. E. PARISH.

LEWIS, P. K., JR., HOEKSTRA, W. G. & GRUMMER, R. H. (1956). **The action of high calcium and self-feeding in aggravating**

parakeratosis.—*J. Anim. Sci.* **15**, 1265-1266. 1187

Preliminary experiments showed that a high calcium level in the diet produced parakeratosis which could be prevented by zinc supplements. Adding zinc to the diet resulted in increased zinc content of the plasma, liver, hair, bone and pancreas, but not of the intestine or skin. Increasing the calcium content of the diet resulted in increased levels of zinc in the liver, kidney and hair. *In vitro* experiments indicated that high levels of calcium reduced availability of zinc for adsorption or readsorption from the intestinal tract.

In another experiment pigs fed a ration containing 1.4% Ca and 33 p.p.m. Zn gained an average of 0.21 lb. daily when the food was fed dry and *ad libitum*, but they gained 0.43 lb. daily when the same ration was fed wet in more than ample amounts. After 11 weeks the wet fed pigs were fed only twice a day in amounts that were consumed in 30 min.; they then gained an average of 0.83 lb. daily whereas those fed the food dry and *ad libitum* gained an average of 0.35 lb. daily.—W. E. PARISH.

KLUSSENDORF, R. C. (1956). **Zinc: in parakeratosis and in health.**—*Vet. Med.* **51**, 301-305 & 310. 1188

A brief review of the role of zinc in animals and man in health and disease.

—D. S. PAPWORTH.

GERSHOFF, S. N. & HEGSTED, D. M. (1956). **Effect of vitamin D and Ca: P ratios on chick gastrointestinal tract.**—*Amer. J. Physiol.* **187**, 202-206. [Authors' summary modified.] 1189

The effect was studied of feeding diets containing Ca and P in various ratios (4:1, 1:1, 1:2) to rachitic and non-rachitic chicks. The Ca:P ratios used had no significant effect on Ca absorption in chicks receiving vitamin D, but were of importance in the Ca absorption of rachitic chicks. Vitamin D increased Ca absorption in chick duodenum but had no effect on glucose absorption. Increased peristalsis occurred when either vitamin D or the diet with the least rachitogenic Ca:P ratio (1:1) was fed, and a slight increase in respiration of intestinal mucosa was observed.

BRÜGGEMANN, J., TIEWS, J. & GRAMATZKI, F. (1956). **Über den Einfluss unterschiedlicher Vitamin A-Dosierungen im Kükenalleinfutter auf die Entwicklung von Eintagsküken bis zur 8. Lebenswoche.** [Influence of different amounts of vitamin A in the food on the

development of day-old chicks up to 8 weeks.] — *Arch. Geflügelk.* **20**, 162-193. [English summary.] **1190**

The authors studied the effect of various doses of vitamin A in 540 chicks on a diet low in vitamin A. Of those not receiving A supplements, about 90% died. Mortality was also high in those receiving doses up to 2,000 i.u. of vitamin A/kg. feed. Supplements of 4,000 i.u. produced weight increases which were considered satisfactory and economical although those produced by 7,000 i.u. were higher by 7%.—E.G.

COLES, R., GORDON, R. F., CHUBB, L. G. & CUMBER, F. (1956). The influence of dietary carotene on the mortality pattern of fowl with some observations of the influence of condensed fish solubles.—*J. Sci. Fd Agric* **7**, 692-699. [Authors' summary modified.] **1191**

In a study on the incidence of mortality from vitamin A-deficiency and the depression in egg production in fowls fed with vitamin-A-deficient rations, using stock known to be susceptible to fowl paralysis and avian leucosis and in which the death rate from these diseases was high, no consistent correlation was found between deficiencies of dietary vitamin A and the incidence of fowl paralysis and avian leucosis. With low levels of carotene (500 i.u. of vitamin A/lb.) a marked death rate from vitamin A-deficiency did not occur until 5 to 8 months after feeding the deficient diet (begun when the pullets were $3\frac{1}{2}$ months old). Egg production was initially delayed by 4-6 weeks, but a marked depression was not manifest until well into the season. Increase of mortality from vitamin A-deficiency and further depression of egg production occurred when a vitamin A-deficient diet was supplemented with fish solubles, but this was not apparent with diets having high levels of vitamin A. It is tentatively suggested that the destruction of vitamin A by animal protein may be caused by some factor in the water-soluble part of animal protein.

COLLET, P., CANTENOT, G., JULLIEN, G. & RICORD. (1955). Nouveau cas d'hypervitaminose D₂ chez le chien. [New case of hypervitaminosis D₂ in a dog.]—*Bull. Soc. Sci. vét. Lyon.* **57**, 303-306. **1192**

The authors reported a further fatal case (they had described one in 1952) in a puppy, 3 months old, that had been treated for rickets with 15 mg. calciferol *per os* weekly for 2 months. As in the previous case, there was

massive calcification of the pylorus. P.M. examination revealed multiple calcification of the organs, extending in most cases into the greater part of the parenchyma; the long bones were porous and very friable. [See also *V.B.* **25**, 2960.]—F.E.W.

GEBAUER, H. (1956). Über Paravitaminosen E. (Vitamin E-Mangel-Spätschäden). [Sequelae of vitamin E deficiency.]—*Tierärztl. Umsch.* **11**, 327-329. **1193**

Fowls kept temporarily on a vitamin E deficient diet developed deformities of the sternum and frequently also of the spine. Lack of vitamin E also caused weakness of the legs which responded to treatment with massive doses of vitamins A and D, but could be prevented by a diet containing vitamin E. Vitamin E appeared to have a sparing effect on the requirements of vitamin D and possibly also vitamin A and thiamine. Dilatation in ducks and fowls of parts of the gastro-intestinal tract, particularly of the pylorus, and obstruction of the small intestine, were also associated with temporary lack of vitamin E in the diet. Similar sequelae to vitamin E deficiency may occur in mammals, particularly in sheep, calves and pigs.—E.G.

MACHLIN, L. J. & SHALKOP, W. T. (1956). Muscular degeneration in chickens fed diets low in vitamin E and sulfur.—*J. Nutr.* **60**, 87-96. [Authors' summary slightly modified.] **1194**

Chicks fed diets low in vitamin E and sulphur to 4 weeks of age developed a muscular degeneration manifested grossly as white striations of the breast and leg muscles, and microscopically as a hyaline degeneration. No significant changes were noted in the tissues of the gizzard, heart, liver, pancreas, kidney or spleen. The addition of alpha tocopheryl-acetate, methionine, cystine, or a high level of diphenyl-*p*-phenylenediamine (0.25%) to the diets prevented muscular degeneration. Addition of 0.5% of sodium sulphate slightly reduced the incidence of muscular degeneration. However, supplements of brewers' yeast, tryptophan, chlortetracycline, inositol, taurine or thiotic acid had no effect on the incidence.

WINTER, H. (1956). Nutritional encephalomalacia of chickens. Report and histology study of field outbreaks on the University Farm.—*Aust. vet. J.* **32**, 269-273. [Author's summary modified.] **1195**

Considerable losses were caused by a nervous disease among the 1,200-2,500 chickens

hatched during each of the last 4 years on the Queensland University Farm. As a result of clinical, macroscopic and microscopic P.M. examinations as well as negative transmission experiments the condition was diagnosed as nutritional encephalomalacia. It was suggested that storage of the chicken mash over an unknown period of time in a hot climate may have led to oxidation of α -tocopherol and fat.

CARNE, P., HOE, C. M., WILKINSON, J. S. & HARVEY, D. G. (1956). Two cases of spontaneous diabetes mellitus in the dog.—*Brit. vet. J.* **112**, 531-535. **1196**

Case reports, with observations on treatment with insulin and by adjustment of diet.

—R.M.

KOLESOV, A. M., GORBELIK, R. V. & DEMENT'EV, I. L. (1956). [Alimentary ketonuria of pregnant sheep.]—*Veterinariya, Moscow.* **33**, No. 10. pp. 68-71. [In Russian.] **1197**

In the U.S.S.R. the basic cause of ketosis of pregnant sheep was considered to be a protein-deficient diet. 70-100% of affected sheep died if untreated. Treatment of affected sheep comprised the giving of $\frac{1}{2}$ litre cows' milk (preferably separated) twice daily by mouth and either 15-20 g. sodium acetate (or citrate) in $\frac{1}{2}$ litre water daily for 4-5 days by mouth, or 30-80 ml. of a soln. of 2 g. sodium hyposulphite and 20-40 g. glucose in 100 ml. distilled water, intravenously. In addition, 40-60 ml. of 40% glucose soln. was given i/v, and 2-3 ml. of 20% caffeine soln. s/c, as required.—R.M.

SWAN, J. B. & JAMIESON, N. D. (1956). Studies on metabolic disorders in dairy cows. II. Observations on the aetiology of metabolic disorders in four Waikato dairy herds.—*N. Z. J. Sci. Tech. Sect. A.* **38**, 316-325. [Authors' summary copied *verbatim*.] **1198**

Concurrently with the field survey of metabolic disorders in dairy herds (Swan and Jamieson 1956) [V.B. **27**, 549], a fairly detailed investigation was made of four typical herds in the Waikato district. Two of these had a record of little or no incidence, and two of regular and fairly marked incidence of metabolic disorders. The biochemical data on normal cows and on clinical cases of metabolic disease in these herds are presented with a brief account of some of the major differences in feeding methods practised in these four herds. In addition, a general

account is given of the feeding and managemental conditions in a number of other herds where metabolic disorders occurred.

BLOSSER, T. H. & ALBRIGHT, J. L. (1956). Urinary calcium excretion and blood calcium levels in the bovine near the time of parturition.—*Ann. N.Y. Acad. Sci.* **64**, 386-397. **1199**

Recent studies on the levels of calcium and other constituents under varying conditions in the blood and urine of normal parturient cows and cows with parturient paresis are reviewed (42 references). Milking before calving and incomplete milking *post partum* have no effect on the serum calcium levels or on the incidence of parturient paresis, but mastectomy prevents the fall in calcium levels occurring at parturition and parturient paresis does not develop. Treatment by udder inflation slowly raises the blood calcium level and relieves the condition, as also do injections of 25.5% calcium borogluconate solution. Injection of calcium at calving does not prevent parturient paresis and, in large amounts, may even precipitate an attack. No appreciable variations in the urinary calcium of normally freshening, milk fever, and borderline cows have been observed, whilst extremely erratic blood calcium levels have been observed in a cow developing parturient paresis. A negative calcium balance for the month preceding parturition has been reported in cows which subsequently developed parturient paresis. The blood and urinary picture in milk fever does not conform to that of hypoparathyroidism in man or laboratory animals.

—A. ACKROYD.

HIBBS, J. W. & POUNDEN, W. D. (1956). Effect of parturient paresis and the oral administration of large prepartal doses of vitamin D on blood calcium and phosphorus in dairy cattle.—*Ann. N.Y. Acad. Sci.* **64**, 375-385. **1200**

Parturient paresis did not develop in cows fed 20 or 30 million units of vitamin D as viosterol or as type 142-F irradiated dry yeast daily for 3-7 days immediately before parturition, and their serum calcium and phosphorus remained at or above the normal levels. Smaller doses of vitamin D for longer periods did not prevent the development of parturient paresis nor materially influence the excessive falls occurring in the blood levels of Ca and P. The large doses given for more than 7 days were toxic.—A. ACKROYD.

DISEASES, GENERAL

LANGELER, J. E. T. (1956). Aantekeningen bij de in Suriname meest voorkomende ziekten van huisdieren. [The commonest diseases of domestic animals in Surinam.]—*Tijdschr. Diergeneesk.* **81**, 417-429. [In Dutch. English, French, German and Spanish summaries.] **1201**

A general account without statistics. Paralytic rabies, tetanus, equine encephalomyelitis, and diseases caused by helminths and blood parasites were mentioned.—R.M.

AREIAS, J. C. (1956). Economia pecuária no Ultramar Português. Factores que afectam o rendimento dos gados. Normas tendentes a atenuá-los. [Factors affecting animal production in Portuguese overseas territories.]—*Rev. Cienc. vet., Lisboa.* **51**, 91-115. [French summary.] **1202**

The author described the main breeds of cattle and small ruminants in Portuguese Guinea, Angola and Mozambique, and gave an estimate of their numbers. Cattle are kept mainly for work and for beef and produce little milk (except in Lourenço Marques, where dairy cattle are imported to supply the capital). The author discussed the following diseases:—trypanosomiasis, East Coast fever, anaplasmosis, TB., rinderpest (present in neighbouring African territories), bovine contagious pleuropneumonia (a particular problem in Angola), ecto- and endoparasitic infestations, as well as other diseases which are under satisfactory control. In cattle exported from Angola to Portugal for slaughter the incidence of total condemnation for *Cysticercus* is high.—F.E.W.

GORANOFF, Z. (1956). Über die Anwendung des medikamentösen Schlafes bei der Behandlung einiger Krankheiten beim Pferd. [Narcotic sleep in the treatment of some diseases of horses.]—*Schweiz. Arch. Tierheilk.* **98**, 410-413. [English, French and Italian summaries.] **1203**

A preliminary report from Sofia on the use of prolonged drug-induced sleep in an attempt to restrict capillary permeability and thereby to reduce the extent of inflammatory reaction in various acute conditions in horses. Good results were obtained in 12 horses with various inflammations of the extremities by i/v infusion of 25-30 mg./kg. of chloral hydrate, followed immediately by phenobarbitone sodium and/or hexobarbitone sodium 16-20 mg./kg., a treatment which produced 4-6 hours' sleep on each of 3-6 occasions per case, either daily or every

second day. Similar treatment was given to 3 horses with second degree burns. Thiopentone sodium 1.5-2.0% was successfully used i/p in 14 horses before surgery for faecal impaction and eventration.—G. P. MARSHALL.

IRMAY, F. (1956). Beobachtungen über die Aufzuchtseuchen der Kälber und deren Bekämpfung. [Control of calf diseases.]—*Tierärztl. Umsch.* **11**, 360-365; 394-400. **1204**

Calf diseases are estimated to cost Switzerland at least 6 million francs annually. The diseases are omphalitis, scours, paratyphoid, pneumonia, polyarthritis, diphtheria, and *Diphlococcus* infection. Prevention and therapeutic measures were described. The importance of contributing factors was stressed—presence of *Brucella abortus* infection, unbalanced feeding of the dams, vitamin A deficiency, poor housing, and unfavourable weather.—M.G.G.

ANDERSSON, P. (1956). Über die Behandlung der volkswirtschaftlich wichtigsten Kälberkrankungen Schwedens (Septikämie durch *Escherichia coli*, Kälberruhr und Pansenindigestion) mit Aureomycin und Pansenensaft. [Treatment of some diseases of calves in Sweden with aureomycin and rumen liquor.]—*Dtsch. tierärztl. Wschr.* **63**, 361-363. **1205**

18 calves with *E. coli* septicaemia, diarrhoea and ruminal indigestion were treated with aureomycin (total 6-14 doses of 250 mg.) and rumen liquor (total 2-4 doses of 0.5-1 litre). More or less rapid recovery occurred in 17 of the 18 animals.—G. P. MARSHALL.

GERMANN, P. (1956). Krankheiten und Geburshilfe bei Ziegen im Frutigtal und Saanerland. [Diseases and obstetrics in goats in Frutigen and Saanen.]—*Schweiz. Arch. Tierheilk.* **98**, 425-452. [English, French and Italian summaries.] **1206**

The most important disorders of goats that have occurred in this area in recent years are reviewed: diseases of the skin, digestive and respiratory systems, udder, hooves, and bones, TB., diseases of the new-born, and particularly sterility and diseases of reproduction.—M.G.G.

GREZIN, V. F. & NOSKOV, A. I. (1956). Use of antibiotics in gastro-intestinal diseases of piglets and in swine dysentery.]—*Proc. Lenin Acad. agric. Sci.* **21**, No. 9. pp. 3-6. [In Russian.] **1207**

Excellent results were claimed for the treatment of diarrhoea in 1,130 piglets and dysentery in 2,060 older pigs by administering

one of the following in the food:—biomycin hydrochloride at 15 mg./kg. body wt. twice daily; calcium salt of biomycin, at 4 times the dosage of the hydrochloride; biomycin mycelial mass (residue from biomycin manufacture) at 30 g. daily for each adult pig and 10-15 g. for each month-old piglet. Sintomycin was also effective when a 1% aqueous soln. was given as a drench at 30-40 mg./kg. body wt. followed by a half dose after 7-8 hours. Streptomycin was stated to be less effective than biomycin and sintomycin. For prophylactic purposes, biomycin mycelial mass was added to the food at the rate of 20 g. daily for a pig aged 1½-2 months and 5 g. daily for a piglet: it caused an increase in growth rate. Administration of the antibiotic to sows appeared to diminish the incidence of gastro-intestinal disorders in their offspring.—R.M.

STEWART, C. M. (1956). Dry coat or non-sweating in horses in India.—*Irish vet. J.* 10, 189-192 & 208-210. **1208**

S. considers that there is a close connexion between the non-sweating syndrome in horses and "panting" in cattle of European ancestry in the Tropics. Usually, only animals with a high metabolic rate are affected—racehorses, work-horses, and high-yielding dairy cattle. Preventive measures are air conditioning in stables and the maintenance of susceptible horses in hilly country, whence they are sent to the races by rail, returning the same evening.—M.G.G.

KUIKEN, J. R., HILL, D. L. & LUNDQUIST, N. S. (1956). A hyalin-fibrin complex in the bovine mammary gland.—*J. Dairy Sci.* 39, 1299-1303. [Authors' summary copied *verbally*.] **1209**

Microscopic examinations revealed the presence of intra-alveolar bodies in 15 of 25 udders. The bodies were composed of hyalin-fibrin complex lying free in the alveolus and ducts. They generally occurred singly; however, in some instances there were as many as three per alveolus. When an udder contained these bodies, they were found in approximately equal numbers in each quarter.

ROONEY, J. R., JR. (1956). Submucosal glands in the bovine colon.—*Amer. J. vet. Res.* 17, 599-606. [Author's summary modified.] **1210**

Two grossly apparent areas of lymphoid tissue aggregation were found in the bovine colon. Microscopically, the Lieberkühn's crypts in these areas showed a tendency to invade the submucosa, presenting an appearance identical

with that described in man and in other animals and often referred to as the "Schultze picture." Non-specific pathological changes were demonstrable in these submucosal glands in clinically normal animals as well as in animals with hyperkeratosis and with a type of mucosal disease.

CHAMBERS, E. E. (1956). Lipoïd pneumonia in bucket-fed calves.—*N. Amer. Vet.* 37, 1040. **1211**

A disorder in bucket-fed calves was diagnosed by a veterinary pathologist as chronic pneumonia due to an infected byre. However, a medical pathologist to whom a sample of lung tissue was sent reported lipoïd pneumonia. The trouble stopped when the feeding buckets were lowered to the height of a cow's teats.—M.G.G.

BENNETT, H. W. (1956). Urinary calculi of sheep in Western Australia.—*J. Dep. Agric. W. Aust.* 5, 421-422, 425-426, 429-430 & 433. **1212**

In the eastern districts of Western Australia urinary calculi constitute a serious cause of mortality, frequently with losses of up to 10% in rams, and even higher in wethers. Siliceous calculi are by far the most common, and in districts where they are encountered sheep maintained under normal grazing conditions excrete large amounts of silica daily in the urine. Calculi consisting chiefly of calcium carbonate are encountered, particularly in areas where Parakeelya (*Calandrinia* spp.) is the dominant or sole grazing available to sheep. This plant has a high oxalic acid content. Calculi are also found in sheep grazing dominant subterranean clover pastures. These calculi are sulphur-yellow, moist, soft, easily broken, and contain very little mineral material; the nitrogen content is very high.—R. D. BARRY.

TERPSTRA, J. I. & AKKERMANS, J. P. W. M. (1956). De dermatitis crustosa van het varken. [Dermatitis crustosa in pigs.]—*Tijdschr. Diergeneesk.* 81, 755-762. [In Dutch. English, French and German summaries.] **1213**

A study of a skin disease of young pigs, similar to that described as contagious impetigo by Sompolinsky (1953) [*Schweiz. Arch. Tierheilk.* 95, 302; see also *V.B.* 22, 3035], who believed it to be caused by *Micrococcus hyicus*. The present authors denied the possibility of a specific contagious infection and concluded that the condition resulted from a general lowering of the resistance of the body by environmental, nutritional, hereditary and other factors.—R.M.

TOZZINI, F. (1956). Sull'esantema vaioloide dei suini. [Varioloid exanthema in pigs.]—*Zooprofilassi*, 11, 161-166. 1214

A benign diffuse exanthema with a predilection for ears, head, belly and limbs was observed in fattening pigs 8-11 months old. After about 4 weeks the condition subsided, leaving the animals immune. In unweaned piglets it was very mild as compared with swine pox, which it resembled clinically. Swine pox is encountered most frequently in piglets 30-40 days old and rarely in those older than 3 months. Rabbits, although susceptible to swine pox virus, failed to respond to intradermal infection with a suspension of scab material, whereas piglets infected in this manner and by a suspension of lice developed characteristic lesions. The role of lice in the transmission of the disease was discussed.—E.G.

WHITTIER, J. R. (1956). Flexor spasm syndrome in the carnivore. I. Review of its occurrence in the literature as "canine chorea".—*Amer. J. vet. Res.* 17, 720-723. [Author's summary slightly modified.] 1215

WHITTIER, J. R. & GOSS, L. J. (1956). Flexor spasm syndrome in the carnivore. II. Occurrence in a tiger (*Felis tigris*).—*Ibid.* 723-728. [Authors' summary slightly modified.] 1216

WHITTIER, J. R. (1956). Flexor spasm syndrome in the carnivore. III. Further observations in dogs.—*Ibid.* [Author's summary modified.] 1217

I. A spontaneous spasm syndrome, occurring in dogs and frequently following distemper, has been recognized for 150 years. In the literature, the characteristics of the activity by which the syndrome is manifested have been distinguished from those of chorea in man but the syndrome has continued to be so designated and the recent introduction of the term "tremor" to describe the syndrome tends to further the confusion. Numerous observations have established the autonomy of the cerebrum, and the influence of numerous drugs upon the syndrome. The pathological physiology of the syndrome is not yet understood, nor have neural pathological changes been demonstrated corresponding to appearance of the activity in specific muscle groups.

II. An account of flexor spasm syndrome in a tiger. The activity continued during sleep, was diminished by sedatives and abolished by ether, uninfluenced by a single period of artificial hyperpyrexia, markedly increased by thiantoin, and uninfluenced by tridione. A convulsion occurred during a single trial of oral

P-267 [4-n-butoxy-B-(1-piperidyl) propiophenone hydrochloride]. Transection of the spinal cord through frozen segment was followed by no spinal shock effect on deep reflexes below the section. The effect of the transection upon the flexor spasm syndrome could not be determined. Study of pathological changes of the neuraxis revealed abnormalities in cerebral tissue in the motor areas bilaterally, more marked on the right, as organized subpial haemorrhage, and perivascular lymphocytosis with small solitary softening. Specifically, no areas of demyelination were observed.

III. Observations on the spontaneous flexor spasm syndrome in dogs are presented. The syndrome, unmixed with other symptoms, appears as abnormal involuntary activity combined with paresis or paralysis. The activity of affected muscle groups is composed of forceful contractions which are of short duration, simultaneous wherever occurring, and involve flexor muscle groups in the limbs. This activity persists during sleep, and persists in caudal segments despite transection of the spinal cord. It is diminished by sedatives, which abolish it in sufficient dosage, and markedly increased in frequency and forcefulness by dosage with thiantoin. The flexor spasms are identical with activity of the flexion reflex following transection of the spinal cord, except that they occur without an eliciting stimulus, and in regular sequence. The syndrome provides manifold opportunities for physiological and pharmacological investigation of the c.n.s.

CHRISTOPH, H.-J. (1956). Zur Erkrankung der Speicheldrüsen und deren Ausführungsgänge beim Hund. [Diseases of the salivary glands and ducts in dogs.]—*Berl. Münch. tierärztl. Wschr.* 69, 227-231. [English summary.] 1218

An account is given accompanied by some selected case histories, of diseases of the salivary glands and ducts in 27 dogs, seen between 1953-56 at the small-animal clinic of Leipzig University. A method is described for the radiographic demonstration of the excretory ducts, with the aid of a contrast medium.—E.G.

EISENSTEIN, R. (1956). Morphogenesis of calcareous deposition in the adrenal glands of the cat.—*Arch. Path.* 62, 380-385. [Author's summary modified.] 1219

Calcareous deposits were found in the adrenal cortex of 10 of 27 adult cats and fatty metamorphosis in 23. There was no demonstrable difference in incidence between the sexes,

and cats weighing less than 1 kg. were free from both lesions. Calcification occurred in a matrix of acid mucopolysaccharide, and is considered to be a morphogenetic sequel to fatty metamorphosis resulting from injury.

DICKINSON, C. D. & SCOTT, P. P. (1956). **Failure to produce urinary calculi in kittens by the addition of mineral salts, derived from bone-meal, to the diet.**—*Vet. Rec.* **68**, 858-859. [Authors' summary slightly modified.] **1220**

An account of two experiments in which diets containing three levels of mineral salts derived from bone-meal were fed to groups of entire growing newly weaned kittens of both sexes. The only difficulty encountered was to ensure that the kittens on the high mineral diets received a sufficient calorie intake. The kittens grew well, were healthy, and showed no macroscopic or microscopic abnormality of the urinary tract.

ANON. (1956). **Pathologic effects of atomic radiation.**—*Science*. **124**, 60-63. **1221**

This article is the summarized report of the Committee on Pathologic Effects of Atomic Radiation. The known pathological effects are reviewed of radiation on the blood, intestinal tract, skin, bone, lungs, thyroid gland, eyes, gonads, central nervous system, and embryos of man and animals. Very young and very old animals have increased sensitivity. Severe stress (e.g. burns or exhaustion) heightens sensitivity. In the treatment of radiation injury some success has been achieved with antibiotics and properly timed blood transfusions. A strontium level in the human body of 0.1 microcuries, giving in a lifetime one-tenth of the permissible dose, is considered safe.—M.G.G.

SCHJEIDE, O. A., MEAD, J. F. & MYERS, L. S., JR. (1956). **Notions on sensitivity of cells to radiation.**—*Science*. **123**, 1020-1022. **1222**

A possible reason for the high sensitivity of certain nucleated cells to radiation is that oxidizing radicals produced by radiation disrupt the anaerobic metabolism of the nuclei. The nuclei in these cells play an unusually active role in cellular metabolism and are large compared with the volume of cytoplasm present.

—M.G.G.

GIBBONS, W. J. (1956). **Lightning stroke.**—*N. Amer. Vet.* **37**, 745-746. **1223**

Two cases of lightning stroke in cattle and pigs are described. Evidence that the trees under which the animals were found had recently been struck by lightning and, in the cattle, singeing of the coat obviated the need for P.M. examination.—M.G.G.

SCHLUEP, U. (1956). **Die Untersuchungstechnik des Liquor cerebrospinalis von Haustieren mittels der Papierelektrophorese, sowie die Analyse desselben bei einigen gesunden und kranken Tieren.** [Technique of examination of the cerebrospinal fluid of domestic animals by paper electrophoresis, with the analysis of some results in healthy and diseased animals.]—*Zbl. VetMed.* **3**, 341-358. [English, French and Spanish summaries.] **1224**

Based on electrophoretic examination of c.s.f. from about 50 healthy and diseased cattle and a number of dogs, S. stated that c.s.f. values were generally similar to corresponding serum values. There appeared, however, to be a tendency for γ -globulin levels in c.s.f. to be lower and β -globulin levels to be higher than in serum. Further research on a larger scale to confirm that this is always so, appeared necessary. The diagnostic value was discussed.

—E.G.

FORMSTON, C. (1956). **Examination of the eye with special reference to the horse and dog.**—*Vet. Rec.* **68**, 984-989. Discussion: pp. 989-993. [Author's summary slightly modified.] **1225**

Precise and methodical examination is essential in ophthalmology. Naked-eye examination has its limitations. Aids such as the use of a staining agent, good illumination, magnification, and the use of the ophthalmoscope play an important rôle in accurate diagnosis. Following a detailed scrutiny of its adnexa the ocular structures are examined serially commencing with the cornea and ending with the fundus. For the structures comprising the anterior segment, focal illumination plus magnification with a binocular loupe is a distinct advantage over naked-eye examination. For the posterior segment, an electric ophthalmoscope is essential. F. described the diagnostic features of most of the principal lesions which occur in the horse and dog.

POISONS AND POISONING

ANON. (1956). Chronic arsenic poisoning.—*Brit. med. J.* Aug. 11th, 351-352. 1226

Dimercaprol (British anti-lewisite) is an effective antidote in arsenical poisoning, combining with both free and bound arsenic in the body. Cell damage, however, may be irreversible. In chronic poisoning arsenic can be detected in the urine or vomitus; it may also be found in keratin long after ingestion. A new method of detection is that of analysis by radio-activation. Specimens such as hair and skin are irradiated in a nuclear reactor; measurement of the subsequent radioactivity indicates the quantity of target element present. A much higher sensitivity is claimed for this method than for chemical methods.—M.G.G.

PEARSON, J. K. L. (1956). Copper poisoning in sheep following the feeding of a copper-supplemented diet.—*Vet. Rec.* 68, 766-768. [Abst. from author's summary.] 1227

Four acute cases of copper poisoning were described in a flock of 164 ewes that had been supplied with a mineral-supplemented feed for 3½ months in winter; 2 of the deaths occurred 3 weeks after supplementary feeding had stopped, one after 8 weeks and one after 5 months. The liver copper values were recorded together with P.M. and histological findings. Of 7 apparently normal sheep in the flock, one had a liver copper value of 1,300 p.p.m. of dry matter. P. discussed the influence of stress in promoting the haemolytic crisis.

I. CUNNINGHAM, I. J., HOGAN, K. G. & BREEN, J. N. (1956). The copper and molybdenum contents of pasture grown on the different soils of New Zealand.—*N. Z. J. Sci. Tech. Sect. A.* 38, 225-238. [Authors' summary modified.] 1228

II. CUNNINGHAM, I. J. & HOGAN, K. G. (1956). Molybdenum content of pasture after top-dressing with molybdates.—*Ibid.* 248-267. [Authors' summary modified.] 1229

I. The authors consider that results from analysis for copper and molybdenum of a small number of pasture samples taken on representative areas of a given type of soil will give an indication of the copper and molybdenum for pastures over the whole area covered by that type of soil. They applied this principle to the consideration of results from 900 pasture samples collected in the spring from 280 soils in the North and South Islands of New Zealand. Using as criteria less than 5 p.p.m. copper as deficient, and 3 p.p.m. molybdenum or more as

too high, it was found that relatively small areas in both islands are deficient in copper and that in the North Island large areas totalling about 5 million acres and somewhat smaller areas in the South Islands produce pastures with above-normal amounts of molybdenum. They discussed these results in their application to agricultural advisory work on stock health and on the use of molybdate fertilizers.

II. The effect of molybdate top-dressing on the molybdenum content of pasture differed markedly with the type of soil to which the molybdate was applied. Pasture samples from field top-dressing trials showed that seven soils in the North Island, representing 20% of the area of the 64 North Island soils examined, gave an abnormally high response to the usually recommended rate of about 2 oz. molybdate per acre, while none of 50 South Island soils examined showed a similar effect. Pastures from all these soils had normal molybdenum contents before top-dressing. Detailed studies were reported of pasture molybdenum after top-dressing of responsive and unresponsive soils. In each case there was a direct relationship between the amount of molybdenum found in the pasture and the amount applied, but on responsive soils the increase was much higher and more persistent. Perennial ryegrass took up slightly more molybdenum than white clover from molybdate top-dressing. Attention was drawn to the need for considering response before using molybdate as a top-dressing, so as to avoid inducing molybdenum levels that might be toxic to grazing stock, and a number of the responsive types of soil were identified. Cobalt top-dressing at 5 and 10 oz. cobalt sulphate per acre did not affect the molybdenum content of pasture. Appreciable transfer of molybdenum from top-dressed to adjacent untreated plots occurred in the excreta of grazing sheep used to control the pasture growth on the plots.

BASS, B., MCCALL, J. T., WALLACE, H. D., COMBS, G. E., JR., PALMER, A. Z. & CARPENTER, J. E. (1956). High level copper feeding of growing-fattening swine.—*J. Anim. Sci.* 15, 1230. 1230

Pigs given 250 p.p.m. of copper as copper sulphate in the diet grew more slowly and used food less efficiently than controls. P.M. examination of a pig that died revealed symptoms of copper poisoning. The livers of treated pigs contained 1,260 p.p.m. of copper as against 48 p.p.m. in controls.—M.G.G.

HEIN, J. W., BONNER, J. F., BRUDEVOLD, F., SMITH, F. A. & HODGE, H. C. (1956). Distribution in the soft tissue of the rat of radioactive fluoride administrated as sodium fluoride.—*Nature, Lond.* 178, 1295-1296. 1231

The highest concentrations of fluoride 30 min. after oral administration, or 10 min. after i/v injection, were in the thyroid, kidneys and adrenal glands. The kidneys and adrenals still contained the highest concentrations 90 min. after i/v injection, but with less fluoride in the thyroid; after this same interval the parotid glands and spleen showed increased concentration. The principal route of excretion was *via* the kidneys. There was also a sharp decrease in tissue fluoride concentrations from the 10th to the 90th min. after i/v injection, showing rapid removal from the tissues and blood. The percentage distribution in all tissues is given in a table.—E.V.L.

BORGMAN, R. F., RUMBAUGH, M. D. & CAMPBELL, G. L. (1956). The recovery of rats administered diisopropyl phosphorofluoridate as influenced by female sex hormones, blood injections, vitamin B₁₂, and iodinated casein.—*Amer. J. vet. Res.* 17, 781-785. [Authors' summary modified.] 1232

In female rats the recovery of red cell cholinesterase activity after poisoning with diisopropyl phosphorofluoridate (DFP) was not influenced by ovariectomy; by injections of oestradiol or progesterone after ovariectomy; by daily injections of vitamin B₁₂; or by feeding iodinated casein. In those given blood injections the pattern of recovery of red cell cholinesterase activity was irregular, the activity being higher than in the controls one week after poisoning. The normal red cell cholinesterase activity in female rats was about the same as that of males.

The recovery of brain cholinesterase activity after poisoning was not influenced by blood injections, but appeared to be retarded by feeding iodinated casein. Complete recovery of brain cholinesterase activity appeared to require considerable time.

Ovariectomized rats receiving oestradiol recovered a normal appearance more rapidly than controls after DFP poisoning and those given blood injections did not appear to have undergone as great a degree of shock as the others and they also recovered rapidly.

FRUNDER, H., FISCHER, W. & BÖRNIG, H. (1956). Die primären Stoffwechselveränderungen in der Leber nach CCl₄-Vergiftung. [Primary metabolic lesions in the liver in carbon tetrachloride poisoning.]—*Hoppe-*

Seyl. Z. 306, 112-119. [English summary.] 1233

The authors stated that a feature of carbon tetrachloride poisoning was the depletion of liver glycogen and a marked reduction in the free glucose content. There appeared to be disturbance of mitochondrial function. There was a marked increase in acid-soluble phosphorus, inorganic phosphorus, adenosine diphosphate, lactic acid and diphosphopyridine nucleotide. Fructose diphosphate, triose phosphates, pyruvic acid and α -ketoglutaric acid were increased slightly.—E.G.

HOFFMAN, J., HIMES, M. B., KLEIN, A., POULOS, V. & POST, J. (1956). Responses of the liver to injury. Effect of previous injury upon the healing pattern after acute carbon tetrachloride poisoning.—*Arch. Path.* 62, 96-102. 1234

The design of the experiments in rats was to produce hepatic injury with carbon tetrachloride, and after an interval of 8 weeks to produce a second injury with the same chemical. The course of healing of this second injury was then compared with that of a single injury in comparable rats similarly managed. All the rats survived. A marked change in nuclear type of the hepatic cells remained long after histological repair of the acute CCl₄ injury, the second injury healing much more slowly than the first.

—D. S. PAPWORTH.

QUINLAN, J. (1956). A note on the occurrence of acute ergot (*Claviceps purpurea*) poisoning in steers.—*J. S. Afr. vet. med. Ass.* 27, 113-114. 1235

After feeding for 3 days on ripened *Paspalum dilatatum* grass heavily infested with ergot, most of a group of 23 steers showed hypersensitivity and marked ataxia. The animals were removed to clean pasture and recovered within 2-7 days.—M.G.G.

NICOLAU, A., BARZĂ, H., DUCA, H., CRETEANU, C., MAY, H. & POPOVICIU, A. (1956). Vergiftungen durch die Pflanze Glechoma hederacea beim Pferde. (Toxisches, akutes Lungenemphysem des Pferdes). [Acute emphysema of the lungs in horses caused by ingestion of ground ivy (*Glechoma hederacea*).]—*Mh. VetMed.* 11, 534-538. 1236

Horses given freshly cut lucerne mixed with ground ivy developed after 5 days acute pulmonary emphysema, rapid breathing, and, in some cases, a rise in temperature. Lymphocytosis was observed. There were heart complications in 18 of the 42 cases, of which 6 died.

—M.G.G.

PARRISH, H. M., SCATTERDAY, J. E. & MOORE, W. (1956). The use of antihistamine (phenergan) in experimental snake venom poisoning in dogs.—*J. Amer. vet. med. Ass.* **129**, 522-525. [Authors' summary modified.] **1237**

Promethazine hydrochloride ("Phenergan"), a potent, non-toxic, antihistaminic drug, was used for treating mongrel dogs which had been poisoned by western diamondback rattlesnake (*Crotalus atrox*) venom. All those given a lethal dose of venom, and treated 30 to 60 min. later with Phenergan, died. The survival time of the treated animals was less than that of untreated controls. Evidently, the drug potentiated the toxicity of the venom. Antihistamine drugs are therefore contra-indicated in the treatment of snake venom poisoning in dogs.

MCGIRR, J. L. (1956). Present day toxicity problems—a review.—*Vet. Rec.* **68**, 902-909.

Discussion: pp. 910-917. [Author's summary modified.] **1238**

The author discussed poisoning in livestock arising from the agricultural use of toxic chemicals. He dealt with lead, arsenic, copper, fluorosis, bovine hyperkeratosis, sulphonamide toxicity in poultry, certain rodenticides, organomercurial fungicides, the chlorinated hydrocarbon and organo-phosphorus insecticides, and the hormone and dinitro weed-killers. He pointed out that, despite the increasing use of many new synthetic products for pest destruction, the vast majority of cases of poisoning on the farm are due to careless use of lead and arsenic compounds. Sources of the poisonous substances mentioned, symptoms produced, P.M. findings and lethal doses and/or toxic levels in tissues were given. Brief mention was made of the legislation controlling the use of toxic chemicals in agriculture in Great Britain and of the voluntary system for approval of new products.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease).

MARTIN, J. E. & BECK, J. D. (1956). Some effects of chlorpromazine hydrochloride in horses.—*Amer. J. vet. Res.* **17**, 678-686. [Authors' summary modified.] **1239**

In a preliminary pharmacological study in horses, i/m doses of 2-4 mg./kg. body wt. produced a slight tachycardia and hypotension; a slower, more regular, and deeper breathing pattern; and a slight fall in body temperature. In horses confined under quiet conditions in stalls, doses of 2.5 mg./kg. or larger, produced signs of moderate to marked depression within an hour after injection, lasting for at least 6 hours. Some horses were still depressed 24-48 hours later.

Chlorpromazine hydrochloride (1.5 or 2 mg./kg.) when combined with meperidine (pethidine) hydrochloride (750 or 5,000 mg.) produced a degree of depression comparable to that seen with larger doses of chlorpromazine when given alone.

Repeated doses of chlorpromazine hydrochloride for 3 days (2 mg./kg. daily) or 5 days (1 mg./kg. daily) resulted in a fall in the number of circulating r.b.c. and in the haemoglobin concentration. This effect sometimes lasted for 2 weeks. The use of chlorpromazine hydrochloride in several clinical cases is described and the possibilities for its use as a therapeutic agent are discussed briefly.

GRADESS, M. (1956). Promazine in small animal practice.—*Vet. Med.* **51**, 587-588. **1240**

Promazine hydrochloride was given in an oral or intramuscular dose of about 1.5 mg./lb. body wt. to 91 dogs which showed nervousness when presented for treatment. The results were good; the animals were calmed without evidence of sedation or hypnosis and the effect lasted for 4-6 hours.—M.G.G.

GADDUM, J. H. (1956). The estimation of the safe dose.—*Brit. J. Pharmacol.* **11**, 156-160. **1241**

Statistical methods are outlined for attempting to determine the largest dose of a toxicant which may be considered safe, given certain toxicity test data.—D. S. PAPWORTH.

FAIRBROTHER, R. W. & WILLIAMS, B. L. (1956). Two new antibiotics. Antibacterial activity of novobiocin and vancomycin.—*Lancet.* **271**, 1177-1179. [Authors' summary slightly modified.] **1242**

Sensitivity tests by the filter paper disc and serial dilution techniques indicate that vancomycin and novobiocin are active against most Gram-positive cocci and should be particularly valuable in the treatment of infections caused by penicillin-resistant staphylococci. Little or

no activity was found against the Gram-negative bacilli usually associated with urinary infections.

LARSON, E. J., CONNOR, N. D., SWOAP, O. F., RUNNELLS, R. A., PRESTRUD, M. C., EBLE, T. E., FREYBURGER, W. A., VELDKAMP, W. & TAYLOR, R. M. (1956). *Novobiocin, a new antibiotic. VI. Toxicology.* — *Antibiot. & Chemother.* 6, 226-230. [Spanish summary, p. 250.] **1243**

Studies in laboratory animals showed novobiocin to have moderate acute toxicity in mice, this being somewhat higher in g. pigs. In short-term experiments in dogs, high i/v doses (100 mg./kg. daily) affected the liver and the kidney, and a concentration of 130 mg./ml. irritated the veins. Long-term oral treatment produced no significant signs of toxicity in rats and dogs. Long-term s/c treatment (70 days) in cats produced no evidence of systemic or eighth-nerve toxicity, but occasioned considerable local tissue injury. Moderate irritation was set up in rabbit skeletal muscle.—G. P. MARSHALL.

RINSLER, M. G. & CUNLIFFE, A. C. (1956). *Penicillin by mouth. Laboratory studies of absorption of penicillin V.* — *Lancet.* 271, 328-330. **1244**

Penicillin V (phenoxyethyl penicillin) was better absorbed from the digestive tract of human beings than benzylpenicillin (penicillin G). The conc. of penicillin in the blood 1 hour after oral administration of 200,000 units was 1.28 units/ml. with penicillin V, and 0.28 units/ml. with benzylpenicillin. For therapeutic purposes, the dosage of penicillin V given by mouth should be at least twice that of benzylpenicillin administered parenterally.—R.M.

HENDERSON, G. N. & TAYLOR, W. M. (1956). *A new penicillin for oral administration and its use in small animal patients.* — *Brit. vet. J.* 112, 523-530. [Authors' summary modified.] **1245**

Phenoxyethyl penicillin ("penicillin V"), which is produced by synthetic adaptation of the normal biological process of manufacture, is acid and stable in the gastric juice. This, in conjunction with an apparent intrinsic property, results in satisfactory absorption from the duodenal mucous membrane and the establishment of blood levels comparable with those from parenteral administration. From clinical results in a wide variety of conditions in dogs and cats (122 cases) it appeared that the product was satisfactory as an alternative to the administration of penicillin by injection.

ALSTRÖM, I. & JERSIN, M. (1956). *The effect of sulphanilamide on phosphorus metabolism of horses.* — *Amer. J. vet. Res.* 17, 687-694. [Authors' summary modified.] **1246**

Sulphanilamide, given as a single dose to horses, decreased inorganic phosphorus in the whole blood and plasma, but not when *p*-aminobenzoic acid was also given. When repeated doses of sulphanilamide were given to horses in 7 experiments, severe signs of toxicity appeared in some animals, and two died (one with colic and one with multiple embolisms). One horse had to be destroyed because of myocarditis but the other 4 recovered either when *p*-aminobenzoic acid was added or when sulphanilamide treatment was stopped. Another common effect of repeated doses of sulphanilamide on the phosphorus metabolism was an increase in inorganic phosphorus in the whole blood and plasma and elimination of phosphorus in the urine.

To understand the contrary effect of single and repeated doses of sulphanilamide on phosphorus fractions in the blood, it is necessary to remember Selye's hypothesis that these effects represent different stages in the general adaptation syndrome.

TOURNUT, J. (1956). *Passage à travers le placenta de la vache du sel sodé de sulfadimérazine.* [Passage through the bovine placenta of sulphadimidine sodium.] — *Rev. Méd. vét.* 107, 368-375. **1247**

Blood concentrations of sulphadimidine were assayed in 30 cows in calf, both in the maternal and foetal blood, at times averaging 2.5-3 hours after an i/v injection of 20 g. of the sodium salt in 30% solution. After eliminating various pitfalls in the interpretation of the results, particularly in relation to the time elapsing between the two assays and to the state of anoxia in the foetus, it was concluded that the placenta presents no barrier to the passage of sulphadimidine sodium from the dam to the foetus and that the drug can therefore be used effectively against placental and foetal infections by susceptible organisms.

—G. P. MARSHALL.

I. MOVSUM-ZADE, K. K. (1956). [Pathogenetic treatment of internal non-infectious diseases of animals.] — *Veterinariya, Moscow.* 33, No. 11, pp. 44-48. [In Russian.] **1248**

II. KUZNETSOV, A. K. (1956). [Intravenous application of procaine in surgical diseases of horses.] — *Ibid.* p. 63. [In Russian.] **1249**

I. The so-called pathogenetic therapy at present widely advocated in the U.S.S.R., notably by disciples of Pavlov, is based on the

theory that disturbances in the function of the c.n.s. play a determinative role in the pathogenesis of disease. Therefore treatment should aim at restoring such disturbances, and this aim is fulfilled by administering sedatives and narcotics (including magnesium sulphate or procaine intravenously), or by nerve block with procaine of nerves supplying the affected area. The author reviewed practical applications of these methods. Examples are epipleural block in colic of horses [see also *V.B.* 26, 2715 & 3552], paravertebral block in bovine mastitis [see also *ibid.* 1782 & 3668], and sedatives in theileriosis of cattle [see also *ibid.* 1932].

II. Fifty-nine horses under treatment for surgical diseases (e.g. injuries, burns, post-castration oedema, myositis, paresis) were given daily i/v injections of a 0.25% soln. of procaine in isotonic saline, at a dosage of 1 ml./kg. body wt. and at a speed of 30-40 ml. a min. Up to 4 inj. were given. K. claimed that this "pathogenetic" treatment had beneficial effects on inflammatory processes and the healing of wounds, and it reduced pain.—R.M.

UNMÜSSIG, K. (1956). Beitrag zur intraperitonealen Eunarcon-Narkose bei Ferkeln und Läuferschweinen. [Intraperitoneal eunarcon anaesthesia in young pigs.]—*Dtsch. tierärztl. Wschr.* 63, 363-364. 1250

Having been led by various considerations to prefer i/p application of ultra-short-acting barbiturates in pigs, the author used "Eunarcon" by that route in 131 cases, in a dosage 0.4 ml./kg., and obtained satisfactory anaesthesia for surgery involving abdominal hernia, cryptorchidism and amputation of prolapsed rectum. No signs of peritoneal irritation were observed.—G. P. MARSHALL.

PURDY, F. A. & WESTFALL, B. A. (1956). Barbiturates as spinal anaesthetics. —*J.*

See also absts. 976 (nitrogen mustard in chronic mastitis); 989 (bactericidal effect of oleic acid on avian tubercle bacilli); 1005 (furazolidone in mouse typhoid); 1006 (sulphamerazine and sulphathiazole in exp. pullorum disease); 1051 (foot rot); 1072 (surra); 1074 (trichomoniasis in bulls); 1077 (nitro-furazone in avian coccidiosis); 1079 ("furacain" in avian coccidiosis); 1080 (Rauwolfa alkaloids in avian malaria); 1083 ("spirotrypan" in bovine anaplasmosis); 1131-1136 (insecticides); 1150, 1152-1153 & 1155-1156 (anthelmintics); 1163-1165 (antibiotics in nutrition); 1233 (carbon tetrachloride poisoning); 1237 (phenergan in snake bite in dogs); 1316 ("doping").

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

BRODY, S. (1956). Climatic physiology of cattle. —*J. Dairy Sci.* 39, 715-725. 1254

A valuable summary of 8 years' work on heat tolerance by Santa Gertrudis and zebu cattle and cattle of European breeds. Details have been published in a series of 36 bulletins of the Missouri Agricultural Experiment Station. [See also *V.B.* 25, 3055-61; 26, 1412 & 1014-16.] —R.M.

Pharmacol. 118, 318-321. [Authors' summary modified.] 1251

Four barbiturates (pentobarbitone, seconal [quinalbarbitone], barbitone and thiopentone) were used as 5% soln. at 0.05 ml./kg. body wt. as spinal anaesthetics in dogs. They produced complete spinal block persisting for approx. the same time as that resulting from the same volume of 2% procaine soln. No undesirable side effects were observed during or after the anaesthesia.

VAN DER SCHAAF, A. & JAARTSVELD, F. H. J. (1956). Proeven over ontsmetting van de huid. [Experiments on the disinfection of skin.]—*Tijdschr. Diergeneesk.* 81, 949-961. [In Dutch. English summary.] 1252

The authors tested the ability of 20 modern disinfectants to kill within 3 min. *Str. agalactiae*, *Staph. aureus* and *Br. abortus* on teats removed from the udder of slaughtered cows. Five of them were satisfactory:— "Hexoderm" (a hexachlorophene preparation); "Halamid" (a chloramine preparation); 0.4% chloramine; methylated spirit; "Hibitane" obstetric cream (containing 1% chlorohexidine diacetate).

—R.M.

SNYDERS, A. J. (1956). The germicidal effect of hexachlorophene soaps.—*J. S. Afr. vet. med. Ass.* 27, 127-132. 1253

Hexachlorophene soaps had an inhibitory effect on all of various pathogenic organisms tested, particularly Gram-positive organisms. Impregnated filter paper discs were placed on the surface of the cultures or the soaps were incorporated in the culture media. The test organisms were *Erysipelothrix rhusiopathiae*, *Pseudomonas pyocyannea*, *Corynebacterium pyogenes bovis*, *Salmonella typhi* A, *Staphylococcus albus*, *Bacillus anthracis*, *Streptococcus agalactiae*, and a species of *Proteus*.—M.G.G.

HARDY, M. H. & LYNE, A. G. (1956). Studies on the development of wool follicles in tissue culture.—*Aust. J. biol. Sci.* 9, 559-574. [Abst. from authors' summary.] 1255

Explants of skin from 4 sheep foetuses of different ages were cultivated for up to 38 days in a medium of fowl plasma and chick embryo extract. The development of wool follicles of different types was studied both in these living

explants and in serial sections from them. Tissue culture is of potential value for studying mechanical, nutritional or hormonal influences on the initiation and early development of wool follicles and the production of wool.

FERGUSON, K. A., SCHINCKEL, P. G., CARTER, H. B. & CLARKE, W. H. (1956). The influence of the thyroid and wool follicle development in the lamb.—*Aust. J. biol. Sci.* **9**, 575-585. [Authors' summary copied *verbally*.] **1256**

Thyroidectomy of the newborn lamb prevents the maturation of secondary wool follicles. The administration of L-thyroxine to thyroidectomized lambs allows normal follicle development. Body growth and wool growth are also depressed by thyroidectomy and most thyroidectomized lambs do not survive more than a few weeks without replacement therapy. The effects on wool growth do not appear to be secondary to the effects on follicle development. The thyroxine requirements for normal wool growth and for normal secondary follicle maturation appear to be greater than the requirements for general body growth.

NAY, T. & HAYMAN, R. H. (1956). Sweat glands in zebu (*Bos indicus L.*) and European (*B. taurus L.*) cattle. I. Size of individual glands, the denseness of their population, and their depth below the skin surface.—*Aust. J. agric. Res.* **7**, 482-494. **1257**

The numbers of sweat glands per unit area of skin, their size, and their depth below the epidermis were compared in skin biopsy specimens from the mid-side region of two zebu and three European breeds of dairy cattle. Within zebu breeds comparisons were made between sweat glands from the mid-side and the dewlap. The glands were slightly larger and much more numerous on the mid-side. In zebus sweat glands are much larger (longer and of greater diameter) than in European cattle. They are also more numerous, and are much closer to the skin surface. Sweat glands in zebus are sac-like in appearance, with few convolutions, whereas in European cattle they are rarely sac-like and are quite convoluted.—D. F. DOWLING. **1258**

BELL, F. R. & EVANS, C. LOVATT (1956). The relation between sweating and the innervation of sweat glands in the horse.—*J. Physiol.* **134**, 421-426. [Authors' summary slightly modified.] **1258**

Section of the cervical sympathetic nerve leads, after 30-60 min., to spontaneous sweating in the skin area thus decentralized. Stimulation of the sympathetic does not cause sweating, but

rather inhibits it, e.g. it inhibits adrenaline sweating. The experiments support the view that sweating in the horse is normally a response to a humoral stimulus, viz. adrenaline.

HANSARD, S. L. & LYKE, W. A. (1956). Measurement of total body water in sheep using I^{131} labeled 4-iodo-antipyrine.—*Proc. Soc. exp. Biol., N. Y.* **93**, 263-266. [Authors' summary slightly modified.] **1259**

A simple and rapid procedure is presented for the *in vivo* measurement of total body water in sheep using I^{131} 4-iodo-antipyrine as the test substance. Body water values for 62 young and mature sheep averaged 61.3 ± 6.5 and 55.3 ± 6.3 , respectively, by the antipyrine method, and 62.3 ± 6.8 and $56.2 \pm 6.6\%$, respectively by the labelled antipyrine procedure. Thyroid uptake of I^{131} from labelled test substance amounted to 3 to 5% and urinary excretion was less than 20% of administered dose during the critical 5-hour test period. Protein binding was demonstrable, indicating that in sheep both test substances were reversibly bound to plasma protein. Consideration is given to the use of these body water volume values in establishing a predictable relationship to body constituents and to provide additional criteria for estimating animal response to experimental treatments.

KUNKEL, H. O., SPALDING, J. F., DE FRANCIS-CRIS, G. & FUTRELL, M. F. (1956). Cytochrome oxidase activity and body weight in rats and in three species of large animals.—*Amer. J. Physiol.* **186**, 203-206. **1260**

Cytochrome oxidase activity of muscle averaged 9 μ l. of O_2 /mg./hour in cattle, 12 μ l. in pigs, 24 μ l. in sheep and 45 μ l. in rats. The activity of liver averaged 110 μ l. in rats and 25-30 μ l. in the other animals.—R.M.

VERSCHURE, J. C. M. & MARTENS, H. M. L. T. (1956). Studies on histamine. VIII. Influence of anaphylactic shock and of seasonal variations on the histaminase content of tissues of the guinea-pig.—*Acta allerg., Kbh.* **10**, 182-186. [In English. Authors' summary modified.] **1261**

The histamine content of the spleen, kidney, lung and liver tissue of 30 g. pigs was estimated. In 13 animals killed whilst in a hypersensitive state or in a state of anaphylactic shock, no significant alteration of the histaminase values in the organs was observed. During summer, however, the histaminase content of the liver tissue was about 45% lower than in winter.

BACON, J. A., PATRICK, H., HANSARD, S. L. & O'DELL, B. L. (1956). Some effects of parathyroid extract and cortisone on metabolism of strontium and calcium.—*Proc. Soc. exp. Biol., N.Y.* **93**, 349-351. [Authors' summary modified.]

1262

Parathyroid extract increased the urinary excretion of calcium and strontium, and increased deposition of these minerals in the kidney tissue. Cortisone prevented accumulation of strontium and calcium in kidney tissue but did not influence urinary excretion or diuresis.

KRONFELD, D. S. (1956). Effect of butyrate administration on blood glucose in sheep.—*Nature, Lond.* **178**, 1290-1291.

1263

500 ml. of a 10% soln. of sodium butyrate was infused during 50 min. into the jugular vein of Merino ewes. When the blood glucose was initially around the normal value of 40 mg./100 ml. it increased during butyrate infusion by 5-50 mg./100 ml. When the ewes were fasted for 3 days, their blood glucose fell to 25-35 mg./100 ml. and increased again on butyrate infusion by 50-80 mg./100 ml. If the blood glucose was high initially, it fell during butyrate infusion. The results indicated that sheep have a glucostatic mechanism which is facilitated by the administration of butyrate. Apparently gluconeogenesis from butyrate may occur in sheep; the conversion is inhibited by an excess of glucose and stimulated by a shortage.

—E.V.L.

STORMORKEN, H. (1956). The effect of trypsin on blood coagulation and the mechanism of its action.—*J. Lab. clin. Med.* **48**, 519-528.

1264

Ten "in vitro" effects of a solution of crystalline trypsin on the blood coagulation processes were examined. It was shown that trypsin is able to clot decalcified plasma and to convert "purified" prothrombin to thrombin. Calcium and cephalin are able to accelerate this activity of trypsin, although cephalin requires calcium for this effect. The activity of a trypsin-cephalin-calcium mixture depends on proaccelerin.

—D. S. PAPWORTH.

KOLB, E. & BUSSE, U. (1956). Untersuchungen über das Vorkommen von Citronensäure im Serum, Blut und Harn von Haustieren (Pferde, Rinder, Kälber, Schweine, Hunde). [Occurrence of citric acid in the serum, blood and urine of domestic animals.] — *Zbl. VetMed.* **3**, 697-704. [English, French and Spanish summaries. English summary modified.]

1265

The following mean values (in mg.%) were found:— Serum: horse, 2.2; pig, 2.8; ox, 5.1; calf, 5.3; and dog, 3.3. Blood: horse, 0.9; pig, 1.5; ox, 3.1; and calf, 3.2. Urine: horse, 23.9; pig, 12.9; ox, 13.4; calf, 11.9; and dog, 14.3. In spite of the large amounts of citric acid in the diet of herbivora compared with the diet of man, and the varying levels of citric acid in the blood of the different species, and the great differences in energy exchange, the excretion of citric acid is very similar in the various domestic animals.

DAWES, G. S., MOTT, J. C. & RENNICK, B. R. (1956). Some effects of adrenaline, noradrenaline and acetylcholine on the foetal circulation in the lamb.—*J. Physiol.* **134**, 139-148.

1266

Observations were made on 10 mature and 10 immature sheep foetuses to test the hypothesis that substances such as adrenaline and acetylcholine, which are readily destroyed in animals tissues, should have a different effect upon the foetal heart rate and blood pressure according to the route of injection. Apart from the foetal heart rate and blood pressure, the umbilical blood flow was measured by inserting a density flow-meter. Adrenaline hydrochloride, noradrenaline bitartrate and acetylcholine perchlorate were the sympathetic amines examined. Injections of these amines caused a greater change of heart rate when given by a femoral vein than by a jugular vein. Injections of adrenaline and noradrenaline into mature foetuses caused an increase in umbilical blood flow commensurate with the increase of blood pressure. Injections of adrenaline and noradrenaline caused a greater rise of blood pressure in mature foetuses when the umbilical cord was tied and ventilation was begun, than under foetal conditions.—D. S. PAPWORTH.

CLARK, R. (1956). Refresher courses in physiology No. 1. The mechanics of the ruminant stomach.—*J. S. Afr. vet. med. Ass.* **27**, 79-104.

1267

C. described the contractions of the ruminant stomach, eructation, rumination, the role of the oesophageal groove, factors and drugs affecting motility, and emesis. The article is illustrated with recordings of contraction and eructation under various conditions.—M.G.G.

SOMMERVILLE, R. I. (1956). The histology of the ovine abomasum, and the relation of the globule leucocyte to nematode infestations.—*Aust. vet. J.* **32**, 237-240. [Author's summary modified.]

1268

A histological study of the abomasal mucosa

of 3 sheep revealed variations in the number and distribution of peptic and parietal cells, and an abnormal type of parietal cell, identified as the globule leucocyte (Schollenleukozyt) described by Weill (1919), was present in some sections. The incidence of the globule leucocyte was studied in abomasal mucosa from 53 sheep: none were found in 32 sheep which, with one exception, had either never been infested with nematodes, or had been infested for 35 days or less, whereas they were detected in each of 21 which had been infested for periods exceeding 35 days. They were also found in intestinal mucosa but were not necessarily most abundant in the region of the alimentary canal which harboured the nematodes.

McCARTHY, R. D. & KESLER, E. M. (1956). *Relation between age of calf, blood glucose, blood and rumen levels of volatile fatty acids, and in vitro cellulose digestion.*—*J. Dairy Sci.* **39**, 1280-1287.

Estimation of values for glucose and volatile fatty acids (v.f.a.) in weekly blood samples from 18 calves from the first to the 15th week of age revealed a steady decline in glucose during the first 5 weeks and a more or less steady increase in the concentration of v.f.a. during the 15 weeks. In weekly samples of rumen juice the conc. of v.f.a. increased steadily, especially during the first 7 weeks. The percentage of cellulose digestion, as measured in the artificial rumen, increased most rapidly during the first 5-6 weeks. The authors discussed the possible relationship between these findings.—F.E.W.

DOBSON, A. & PHILLIPSON, A. T. (1956). *The influence of the contents of the rumen and of adrenaline upon its blood supply.*—*J. Physiol.* **133**, No. 3. pp. 76P-77P of Proceedings.

1270

Blood flow and blood pH in the posterior vein of the rumen were measured by physical methods, in anaesthetized sheep in which ruminal contents were replaced with known isotonic buffer solutions. Blood flow was increased, and in most cases blood pH was decreased, by (a) introducing CO_2 into rumen, (b) by increasing ruminal concentration of steam volatile fatty acids and (c) by lowering ruminal pH in addition to (b). Lactate or phosphate buffers at pH 4, or sodium bicarbonate, produced no change.

A double effect, consisting of a temporary decrease in ruminal blood flow followed by an increase, was the chief response to adrenaline given as a single dose (15-500 $\mu\text{g}.$) or infusion (2-300 $\mu\text{g.}/\text{min}.$) Such responses were not

marked with intra-ruminal pH of 7.5 but increased as pH lowered. This relationship affected the phase of increased blood flow after adrenaline more than the phase of decreased flow, so that at a ruminal pH of 4, using acetate buffer, the rate of blood flow was very fast.

—R. J. FITZPATRICK.

LINZELL, J. L. (1956). *Evidence against a parasympathetic innervation of the mammary glands.*—*J. Physiol.* **133**, No. 3. pp. 66P-67P of Proceedings.

1271

The udder of the ruminant is partly innervated by the perineal nerves which originate from sacral roots and may thus contain parasympathetic fibres. The only mammary response to perineal nerve stimulation found by the author in lactating sheep and goats was vasoconstriction; by the use of drugs (atropine, eserine, dehydroergotamine and dibenamine) this was shown to be an adrenergic and not a cholinergic mechanism. The spinal origin of these vasoconstrictor fibres and their pathways were traced by the classical methods of stimulation and section of spinal roots and by blocking ganglia with nicotine. These fibres originate in the lumbar segments, and pass along the sympathetic chain to synapse in sacral sympathetic ganglia, the post ganglionics then passing out to sacral nerves and thus to the perineal nerve.

—R. J. FITZPATRICK.

STEVENS, C. E. & SELLERS, A. F. (1956). *Physiological studies of the vagal nerve supply to the bovine stomach. III. Procaine effects on the dorsal vagal trunk.*—*Amer. J. vet. Res.* **17**, 588-593. [Authors' summary modified.]

1272

Procaine hydrochloride solution was injected on to the dorsal vagal trunk during 7 trials on 3 adult cows, while the pressure changes in the rumen and the reticulum were recorded electrically [see *V.B.* **26**, 267]. In all the trials, the efficiency of eructation was impaired after procaine injection, with a rise in intra-ruminal pressure. Electric stimulation of the nerve trunk anterior to, and posterior to, the point of application of procaine indicated that the dorsal vagal trunk may serve as an afferent pathway in an eructation reflex.

I. HUBLÉ, J. (1956). *Gonadal hormones, chondrogenesis and ossification in the young fowl.*—*Acta endocr., Copenhagen.* **33**, 95-100.

1273

II. HUBLÉ, J. (1956). *Gonadal and hypophyseal interactions on the chondrogenesis in young fowl.*—*Ibid.* 101-104.

1274

I. The daily administration of 100 $\mu\text{g}.$

oestradiol benzoate for 7-8 days produced a narrowing of the proliferation zone in the epiphyseal discs of the femur, tibio-tarsus and tarso-metatarsus. There was also a diminution in the area of hypertrophic cartilage, and a shortening of the long bones. Testosterone propionate in a daily dose 300 µg. for 9 days also enhanced endochondrial ossification, but progesterone had no effect on the cartilage. [See also **V.B. 24, 2533.**]

II. Pituitary growth hormone, when injected simultaneously with oestradiol, did not counteract the inhibition of cartilage formation by the oestrogen, but prolactin did. H. suggested that, in birds, prolactin assumed the function of a growth hormone.—R.M.

BISHOP, D. W. (1956). Active secretion in the rabbit oviduct.—*Amer. J. Physiol.* **187**, 347-352. [Author's summary modified.] **1275**

Determinations of the rates of secretion and the pressures against which ligated, catheterized oviducts of anaesthetized rabbits produce tubal fluid indicate that this is an active secretion of the genital tract. Secretory activity is influenced by the hormonal condition of the animal. Both secretory rate and pressure are high during oestrus and low in late pregnancy. Secretory

See also absts. 1321 (text-book, veterinary physiology); 1322 (International review of cytology, vol. 5); 1323 (book, fertilization).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

SHAHANI, K. M., GOULD, I. A., WEISER, H. H. & SLATTER, W. L. (1956). Observations on antibiotics in a market milk supply and the effect of certain antibiotics on the keeping quality of milk.—*Antibiot. & Chemother.* **6**, 544-549. [Spanish summary p. 570.] **1278**

Of 151 samples of raw milk from individual herds only 2 were strongly positive in tests for the presence of antibiotics. Samples of pasteurized churn milk were negative. Chlortetracycline and oxytetracycline were superior to penicillin and streptomycin in improving the keeping quality of pasteurized milk. At a concentration of 1 or 25 µg./ml. in pasteurized milk kept at 40°F. they delayed microbial

See also absts. 998 (E. monocytogenes in meat); 1003 (S. bareilly in slaughter cattle); 1004 (S. orion in slaughter pigs); 1008 (incidence of food poisoning in Gt. Britain); 1010 (brucellosis in slaughter cattle and beef); 1090-1092 (rabies); 1119-1122 (Q fever); 1138-1144 (trichinosis); 1320 (book, toxic substances in air).

REPRODUCTION AND REPRODUCTIVE DISORDERS

MELROSE, D. R. & STEWART, D. L. (1956). The effect on fertility of changes in the composition of the normal egg-yolk citrate semen diluent.—*Brit. vet. J.* **112**, 536-540. [Authors' summary modified.] **1280**

activity is severely reduced after castration, but this decrease can be counteracted by administration of oestradiol benzoate (5 µg. daily for 3 days). The secretory process is stimulated by pilocarpine. The oviduct secretion may be considered to play a vital role in the reproductive economy of the rabbit.

SCHMAHLSTIEG, R. (1956). Euterform und Aufbau des Drüsenparenchyms. [Udder shape in relation to structure of the glandular parenchyma.]—*Dtsch. tierärztl. Wschr.* **63**, 474-480. **1276**

There was no apparent relationship between structure of the glandular parenchyma and outward appearance and shape of the udder in 22 slaughter cows of various ages and at different stages of lactation. Shape of the udder and glandular structure were stated to depend on separate genetic factors.—E.G.

BATE-SMITH, E. C. & BENDALL, J. R. (1956). Changes in muscle after death.—*Brit. med. Bull.* **12**, 230-235. **1277**

A discussion of physical and chemical changes in muscle during rigor mortis, and of the relation of the physical to the chemical changes.—R.M.

spoilage by 2-3 weeks. Treated raw milk spoiled within 3-14 days.—M.G.G.

FLATT, W. P., HORVATH, D. J., DECOSTA, L. C., WARNER, R. G. & LOOSLI, J. K. (1956). Cautions regarding the use of anthraquinone violet as an indicator in digestion trials and absorption studies.—*J. Anim. Sci.* **15**, 1254. **1279**

Pigs were slaughtered after receiving anthraquinone violet for 3 months at 0.025% of the diet. All carcasses had extensive violet coloration, particularly in the fatty tissues, and were rejected by the meat inspector. In a second group, the colour persisted for as long as 7 months after administration of the chemical had ceased.—M.G.G.

The use of 2.9% sodium citrate solution which is isotonic with bovine semen, did not result in an improved over-all conception rate when compared with the usual 3.6% sodium citrate-egg yolk buffer; the semen being used

for a period of 3 days after collection. An improved conception rate was obtained with the isotonic diluent on the second day of use. The addition of 0.05 g. fructose per ml. of diluent did not improve the conception rate of semen stored for use in routine artificial insemination for periods up to 3 days after collection. Semen, diluted in glucose-bicarbonate-egg yolk buffer, showed *in vitro* better survival of the spermatozoa, but gave a significantly lower conception rate, when compared with semen diluted in the usual egg yolk-citrate buffer and used over a period of 3 days after collection.

I. MARDEN, W. & WERTHESSEN, N. T. (1956). **Influence of seminal fluid on sperm motility.** —*Fertil. & Steril.* 7, 508-515. 1281

II. HAAG, F. M. & WERTHESSEN, N. T. (1956). **Relationship between fertility and the non-protein sulphhydryl concentration of seminal fluid in the Thoroughbred stallion.** —*Ibid.* 516-522. [Authors' summaries modified.] 1282

I. A semi-quantitative technique was developed to measure the influence of seminal fluid on the maintenance of spermatozoa motility in stallions' semen; the influence of seminal fluid varied greatly from sample to sample. Further studies indicated that sulphhydryl compounds played a part in this phenomenon: the concentration of non-protein sulphhydryl compounds varied inversely with the sperm-maintaining capacity of seminal fluid.

II. There was an inverse relationship between fertility and the non-protein sulphhydryl concentration of seminal fluid of the stallion. A sharp decline in fertility occurred with concentrations exceeding 10 µg. sulphhydryl/ml., and infertility was virtually certain with conc. above 20 µg./ml.

ASCHBACHER, P. W., SMITH, V. R. & STONE, W. H. (1956). **Observations on fertility following inseminations at three stages of the same estrus.** —*J. Anim. Sci.* 15, 952-958. 1283

Cows were inseminated when first observed in oestrus and again 12 and 24 hours later. Paternity of the calves was determined by blood typing. Twenty-one cows calved from the first, 16 from the second, and 13 from the third insemination.—M.G.G.

PARROTT, D. M. V. & PARKES, A. S. (1956). **Orthotopic ovarian grafting after sterilisation by X-rays.** —*Brit. vet. J.* 112, 550-554. [Authors' summary copied *verbatim*.] 1284

Ovarian tissue was grafted orthotopically by implantation into the ovarian capsules of mice sterilised by exposure to X-irradiation, the

sterilised ovaries being left in position. Fertility was restored in about two-thirds of the animals so treated, though litter size was below normal. The possible uses of orthotopic ovarian grafting in veterinary and biological work are discussed.

WATSON, R. N., SAPSFORD, C. S. & MCCANCE, I. (1956). **The development of the testis, epididymis, and penis in the young Merino ram.** —*Aust. J. agric. Res.* 7, 574-590. [Authors' summary modified.] 1285

The study was made on 110 Merino rams, 1-64 weeks old, in 4 groups according to rate of growth. The weight of the testes at any one age varied widely. It was closely related to body wt. in all groups. As body wt. increased from 23 to 27 kg., the relative increase in wt. of the testes was much greater than that at higher or lower body wt. The general histological characteristics of the testes were closely related to their wt. The tubules were present as solid or only slightly vacuolated cords in all animals which weighed less than 21 kg. Spermatozoa were not seen in the lumen of the tubules in any animal which weighed less than 27 kg. and they were present in all except 3 of those which weighed more than 28 kg. The relative cross-sectional area of the seminiferous tubules increased directly with the relative increase in the wt. of the testes until the testes weighed at least 300 g.

The wt. of the epididymides was more closely related to that of the testes than to age or body wt. Its relation to the wt. of the testes varied in the different groups. Irrespective of the age at which the particular body wt. was attained, little separation of the prepuce from the penis had occurred in animals which were lighter than 18 kg. and separation was more or less complete in most animals which were heavier than 27 kg.

WILLIAMS, S. M., GARRIGUS, U. S., NORTON, H. W. & NALBANDOV, A. V. (1956). **The occurrence of estrus in pregnant ewes.** —*J. Anim. Sci.* 15, 978-983. 1286

Of 50 Western ewes, slaughtered within 20-90 days after mating, 8 had one heat, one had two heats and 2 had three heats between conception and slaughter. Fifteen out of 24 pregnant Rambouillet ewes came into oestrus before parturition. Intervals between heats were variable, ranging from 3 to 40 days with an average of 22 days. Heats were not confined to a part of the gestation period; 4 ewes mated a few days before parturition. Oestrus was not accompanied by ovulation in the ewes which were examined P.M.—M.G.G. . .

SZÉKY, A. & DÓZSA, L. (1956). Beschreibung einer neuen Exzisionszange zur Entnahme biotischen Materials aus der Uterusschleimhaut der Kuh. [An instrument for uterine biopsy in cows.]—*Acta vet., hung.* 6, 391-394. [In German. Russian summary.] **1287**

A specially adapted excision forceps is described, designed for taking samples of uterine mucosa from living cows as a diagnostic aid in cases of sterility—E.G.

SKJERVEN, O. (1956). Histochemische Biopsieuntersuchungen von der Uterusschleimhaut beim normalen nichtträchtigen Rinde. [Histochemical biopsy studies on the uterine mucosa of the normal non-pregnant cow.]—*Zbl. VetMed.* 3, 319-327. [English, French and Spanish summaries. English summary modified.] **1288**

Cyclic changes of alkaline phosphatase, fat and glycogen are described in the normal bovine endometrium. Biopsy material was obtained *per vaginam* from heifers and cows of various ages, during the oestrous cycle or up to 13 days after fertile insemination. All the animals conceived at the first or second insemination and underwent a normal pregnancy. During oestrus the samples were taken immediately after insemination. Methods of fixation and histochemical techniques are described.

The greatest variations occurred in the cytoplasm of the superficial epithelial cells. Alkaline phosphatase activity ran parallel to development and regression of the corpus luteum and was highest midway through the oestrous cycle. The highest glycogen content in the surface epithelium coincided with ripening of the Graafian follicle; it fell again after oestrus and ovulation. Between the 8th and 13th days of the cycle there was hardly any glycogen in the epithelial cells but glycogen granules could be detected within the stroma. During the luteal phase and later in the cycle up to a few days before oestrus, droplets of neutral fat were present. [See also *V.B.* 26, 2739.]

McDIARMID, A., COID, C. R. & ELLIOT, J. (1956). Some aspects of the reproductive history of 473 cattle maintained indoors in an isolation compound for a period of seven years.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 41-43. [French summary.] **1289**

The breeding performance of 473 cattle, maintained indoors for 7 years, compared favourably with that of cattle kept under normal conditions.—E.G.

SHORT, R. V. (1956). Progesterone in the placentae of domestic animals.—*Nature, Lond.* 178, 743-744. **1290**

Ovariectomy may be performed at various stages of pregnancy in the mare, cow, ewe and bitch without inducing abortion, and it has therefore been assumed that the placentae of these animals produce progesterone. By a chemical method described by the author it has been possible to detect in the placenta of the mare several hundred µg. per kg. of press-juice of a substance which was identical with progesterone; but none has yet been found in the late-term placentae of the cow, ewe, sow or bitch.

The placenta of the mare is of the non deciduate, epitheliochorial type and is assumed to be composed of foetal tissue only: this may be an indication that the foetal tissue itself is responsible for the production of progesterone, or for its selective concentration from the maternal circulation.—E.V.L.

BRODAUF, H. (1956). Zur Ätiologie der Endometritis der Stute. [Aetiology of endometritis in mares.]—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 86-88. [In German. English and French summaries.] **1291**

B. discussed the incidence of endometritis as a cause of sterility in mares and some of the factors associated with its aetiology, which included general condition of the mare, susceptibility to genital diseases and disturbances of hormonal origin in the oestrous cycle.—E.G.

POKUDIN, A. A. & SHAKHOTIN, N. G. (1956). [Infectious vaginitis in sheep.]—*Veterinariya, Moscow.* 33, No. 10. pp. 57-59. [In Russian.] **1292**

Acute necrotic vaginitis and posthitis spread rapidly amongst ewes and rams on 3 farms in the Samarkand region of Uzbekistan, at the commencement of the 1955 breeding season. Within 5-10 days after service 375 ewes (out of over 1,000) and 42 rams were affected. The degree of necrosis was severe and was accompanied by fever and depression. Streptococci isolated from the vagina of affected ewes were pathogenic for mice and g. pigs. [No transmission experiments or examinations for virus were reported.] Out of 177 sheep treated with penicillin of "norsulphazole" plus local application of antiseptics, 63 recovered and the remainder were slaughtered.—R.M.

FOGDEGÅRD, G. (1956). A study of the effect of parenteral supplements of vitamin E on the sexual functions of cows with weak heat.—

Proc. IIIrd Int. Congr. Anim. Reprod. Cambridge, 1956. Sect. II. pp. 62-64. [French summary.] **1293**

As a result of experiments with 275 cows and heifers, F. concluded that vitamin E had no marked effect on the intensity of oestrus.

—E.G.

BASSETT, E. G. (1956). Vaginal prolapse in the ewe.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 39-41. [French summary.] **1294**

Prolapse of the vagina is encountered mainly in multiparous ewes. Mortality in both dams and offspring is usually high. In many survivors there are persistent vaginal lesions and sterility. [See also *V.B.* **25**, 3437; **26**, 2740].—E.G.

LANCASTER, M. C. (1956). A survey of pathological changes in the testicles of A.I. bulls.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 71-73. [French summary.] **1295**

The testicles of 57 normal bulls and of 46 slaughtered for low fertility were examined. Testicular lesions in the low-fertility group were of two types, tubular and intertubular. There was intertubular fibrosis, atrophy and so-called "calcification" of tubules, accompanied by Leydig cell proliferation. In others, although macroscopically of normal appearance, spermatogenesis was arrested.—E.G.

SCHÄRER, K. (1956). Aspermie infolge Nebenhodenhypertrophie mit Abszedierung und Hodenatrophie bei einem einjährigen Stier. [Aspermia in a yearling bull with hypertrophy and suppuration of the epididymis and atrophy of the testes.]—*Schweiz. Arch. Tierheilk.* **98**, 453-458. [English, French and Italian summaries.] **1296**

The condition was apparently caused by *Corynebact. pyogenes* infection.—R.M.

BLOM, E. & CHRISTENSEN, N. O. (1956). Examination of the genitals of slaughtered male calves as a means of elucidating the frequency of genital malformation in the bovine male. Studies on pathological conditions in the testis, epididymis and accessory sex glands in the bull. III.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 76-79. [French summary.] **1297**

A report on the results of a survey of malformations of testicles, epididymis, and accessory glands in 38 adult bulls and 5,344 bull calves of the Red Danish and Jersey breeds.

Foetal remnants of parts of the mesonephros, known as the paradidymis, were present in 43%, and Muellerian cysts in about 24% of the Red Danish and in 33% of the Jersey calves. In a small percentage there was segmental aplasia of the Wolffian duct, melanosis of the epididymis and pigmentation of the ejaculatory duct and the glans penis.—E.G.

VAN RENSBURG, S. W. J. (1956). The rôle of delayed ovulation and anovulatory oestrus in the aetiology of functional infertility in bovines.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 52-53. [French summary.] **1298**

The author studied ovulatory failure in 69 Friesian and 94 Africander cows. In 30 ovulation was retarded and 17 failed to ovulate. The conception rate was reduced by about 19% as a result of failure of the follicles to rupture. The cause of this defect was considered to be either constitutional or hereditary. Failure to ovulate and delayed ovulation did not greatly affect the length of the oestrous cycle. The value of stimulation of ovulation by i.m. doses of 15 mg. of stilboestrol dipropionate was discussed.—E.G.

SCHAETZ, F. (1956). Grundlagen der zyklusgebundenen Sterilität des Rindes, mit Berücksichtigung der sog Nymphomanie. [Disturbances of the oestrous cycle in relation to sterility in cattle, with special reference to nymphomania.]—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 56-58. [In German. English summary.] **1299**

A modified and shortened version of a paper by the same author, previously published [*V.B.* **26**, 2119].—E.G.

VANDEPLASSCHE, M., PAREDIS, F. & DEBACKERE, M. (1956). Fertility of cows after caesarian section.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 65-67. [French summary.] **1300**

Of 151 cows served after Caesarian section 78% conceived, whereas the conception rate after normal calving was 88%.—E.G.

DAWSON, F. L. M. (1956). The incidence of salpingitis and bursitis throughout a series of 200 permanently infertile cows, with notes on its significance and on diagnosis.—*Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 46-48. [French summary.] **1301**

An account of clinical and P.M. examina-

tion in 200 sterile cows in 105 of which there was either bursal adhesion or salpingitis. Salpingitis, not complicated by adhesion, was present in 26. Diagnosis by rectal examination was confirmed P.M. in 98%.—E.G.

CSEMBROWICZ, H. J. (1956). Infertility in cattle associated with abnormalities of the fallopian tubes. — *Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 44-46. [French summary.] **1302**

Details were given of examination of 730 cows, 62 of which were pregnant, and 300 maiden heifers. In 30 of the animals there were cysts of the fallopian tubes, 14 cows and one heifer had hydrosalpinx, 28 adhesions of the ovarian bursae, 28 purulent endometritis, 7 pyometra and 19 uterine TB. Three had the following congenital abnormalities: unilateral fallopian atresia, unilateral fallopian duplication and congenital occlusion; 25 had other abnormalities.—E.G.

GROOTENHUIS, G. (1956). Horsebreeding and heredity: abortion, stillbirth and disease in foals. — *Proc. IIIrd Int. Congr. Anim. Reprod.* Cambridge, 1956. Sect. II. pp. 88-90. [French summary.] **1303**

G. concluded from statistical data compiled from 10,000 mares and 105 foetuses and foals, that abortion, stillbirth and mortality in foals are all part of the same syndrome. The hereditary aspect was discussed.—E.G.

KOCH, P. & BRANDENBURG, W. (1956). Über erblich bedingte Missbildungen des Auges beim Hausschwein. [Hereditary malformation of the eyes in pigs.—*Berl. Münch. tierärztl. Wschr.* **69**, 285-288.] **1304**

Details were given of P.M. examination of the eyes of a blind boar and seven of his 29 blind offspring. The dams were not related to the sire and consisted of two apparently normal sisters and one half-sister. In the sire there was atrophy of the optic nerve. Malformations seen in his offspring included hernia of the sclera, hydrophthalmus, atrophy of the internal eye membranes, staphyloma, retinal calcification, and microphthalmus.—E.G.

GUENTHER, F. (1956). Erbliche Entwicklungs-anomalien des äusseren Keimblattes beim Kaninchen Keratose—Hypotrichose—Augen-leiden. [Hereditary developmental anomalies of the ectoderm—keratosis, hypotrichosis and eye diseases—in rabbits.]—*Berl. Münch. tierärztl. Wschr.* **69**, 214-215. **1305**

G. described these diseases in rabbits and

suggested that they were due to prolonged vitamin A deficiency over many generations.

—M.G.G.

ASMUNDSON, V. S. & JULIAN, L. M. (1956). Inherited muscle abnormality in the domestic fowl.—*J. Hered.* **47**, 248-252. [Authors' summary modified.] **1306**

A muscle abnormality, which prevented affected birds from raising their wings and from rising from a flat surface when laid on their backs, occurred in New Hampshire fowls. When compared with normal birds of this breed, affected birds had wider breasts and shorter bones.

Preliminary anatomical studies revealed that most muscles were involved. Gross and microscopic alterations were similar to those occurring in human muscular dystrophy. The abnormal birds were homozygous for an autosomal gene which was recessive to normal.

LANDAUER, W. (1956). Cyclopia and related defects as a lethal mutation of fowl.—*J. Genet.* **54**, 219-235. **1307**

Genetic factors responsible for synophthalmia and related malformations of the head, grouped together under the term perocephaly, ranging from rudimentary upper beak to microcephaly, were studied in chick embryos. Breeding experiments were carried out over a period of 4 years, using various flocks including one of rumpless fowls. Affected embryos rarely hatched. Sex-ratio was normal. The malformations were inherited by the offspring of 21 apparently normal cockerels from known perocephaly-producing parents.—E.G.

EVANS, J. V., KING, J. W. B., COHEN, B. L., HARRIS, H. & WARREN, F. L. (1956). Genetics of haemoglobin and blood potassium differences in sheep.—*Nature, Lond.* **178**, 849-850. **1308**

Designating sheep in 3 types, A, B or AB with respect to their haemoglobin constitution and also classifying them into 2 distinct types according to the potassium and sodium concentrations in their blood, HK (high potassium, low sodium) and LK (low potassium, high sodium), the authors studied the genetic relationships of the different phenotypes in 1,804 animals. Their findings were consistent with the hypothesis that the haemoglobin types are genetically determined by two alleles each responsible for the formation of one kind of haemoglobin; that HK is recessive and that HK

animals can be regarded as homozygous for one allele whereas the LK animals represent the heterozygotes and also the homozygotes for the

See also absts. 1009-1019 (brucellosis); **1029-1031** (leptospiral abortion in cattle); **1038-1049** (vibriosis); **1074** (trichomoniasis); **1137** (Fasciola as cause of bovine endometritis); **1161** (effect of nutrition on gestation in sheep); **1162** (nutritional causes of sterility in cows); **1199-1200** (parturient paresis in cows); **1275** (active secretion in the rabbit oviduct); **1323** (book, fertilization).

ZOOTECHNY

AMARBAEV, A. M. (1956). [Water metabolism in Lincoln sheep during acclimatization to a continental type of climate.]—*Proc. Lenin Acad. agric. Sci.* **21**, 40-43. [In Russian.] **1309**

From a study of Lincoln sheep imported into the Kalinin district (near Moscow) from England, it was recommended that, during acclimatization to the hot summer, grazing should be restricted to from 5 to 10 a.m. and 5 to 10 p.m. From 10 a.m. to 5 p.m. the sheep should be kept in the shade and fed green fodder.—R.M.

LARKIN, R. M. (1956). Behaviour of cattle under tropical conditions.—*Qd agric. J.* **82**, 96-102. **1310**

British breeds of cattle rest more in the hot months than in the cold. Adequate shade is essential, and good quality pastures are required by the grazing animals if they are to get their food requirements in the shorter grazing period. Cattle drink frequently during hot weather: hence drinking water must be both plentiful and readily accessible.

—D. F. DOWLING.

TAYLOR, R. H. & WILLIAMS, R. M. (1956). The use of pellet counts for estimating the density of populations of the wild rabbit, *Oryctolagus cuniculus* (L.).—*N. Z. J. Sci. Tech. Sect. B* **38**, 236-256. [Authors' summary modified.] **1311**

The method involves two steps: (1) estimating the number of faecal pellets on the ground, and (2) relating the number of pellets

other allele. There was no obvious association between any of the haemoglobin types and either of the potassium types.—E.V.L.

to the number of rabbits by measuring the rate at which pellets decay, and the number of pellets voided daily by individual rabbits. The theory and field procedure of sampling methods for measuring the density of pellets and their rate of decay are given. The mean number of pellets voided daily by a rabbit was estimated to be 820 for the wild rabbit in New Zealand. The results from several trials carried out during the development of the method are discussed, and an example is given of its practical application.

DEANS, R. J., VAN ARSDELL, W. J., REINEKE, E. P. & BRATZLER, L. J. (1956). The effect of progesterone-estradiol implants and stilbestrol feeding on feed lot performance and carcass characteristics of steers.—*J. Anim. Sci.* **15**, 1020-1028. **1312**

Fourteen yearling steers received s/c, in pellet form, 1.5 g. of progesterone and 50 mg. of oestradiol, 14 others were each fed 10 mg. of diethylstilboestrol daily, and 14 served as controls. Their average daily weight gains over a period of 18 weeks were 3.03, 2.64, and 2.3 lb. respectively. Food consumption and food conversion efficiency were greatest in the implanted animals and least in the controls. There were no significant differences in carcass grade. The carcasses of the implanted steers had more separable lean and less separable fat than those of the two other groups. Enlargement of the prostatic portion of the urogenital tract and of the bulbo-urethral glands and seminal vesicles was observed in the treated animals.—M.G.G.

TECHNIQUE AND APPARATUS

VIQUE, R. F. (1956). New plastic needle for continuous intravenous therapy.—*Vet. Med.* **51**, 570. **1313**

A plastic tube, 6 in. long and fitted at its free end with a connector for a syringe nozzle, was suitable for semi-permanent insertion in the veins of large animals for the purposes of

needle, 6½ in. long. The metal needle was withdrawn when the tube was in position.

—R.M.

HART, R. J. C. (1956). A sterilizable rack for holding eggs.—*Mon. Bull. Minist. Hlth. Lab. Serv.* **15**, 231. **1314**

A simple rack made from "Perspex"

intravenous drip infusions or to avoid multiple venepunctures. For insertion the tube was sheathed around a 15-gauge metal hypodermic

See also *absts.* 1063 (freeze-agglutination in avian chronic respiratory disease); 1085 (Sabin-Feldman dye-test); 1087 (cultivation in vitro of F. & M. disease virus); 1094 (bovine tongue tissue culture of vaccinia virus); 1118 (laboratory method of demonstrating transmission of viruses); 1146 (cultivation of *Nippostrongylus muris* in vitro); 1287 (instrument for bovine uterine biopsy).

MISCELLANEOUS

SKJOLDAGER, R. N. (1956). Bakterieindholdet i sulfonerede vaskemidler. [Bacterial content of sulphonated detergents.] — *Medlemsbl. danske Dyrlægeforen.* 39, 598-599. [In Danish.]

1315

Six widely used commercial sulphonated detergents were plated out on milk agar and incubated at 30°C. for 2 days. Four fluid detergents were sterile or had a total bacterial count not exceeding 2,000 per ml.; one fluid had a total bacterial count of 33,000 per ml.; that of a powder was 104,000 per ml. In one factory where concentrated detergents were diluted and bottled for retail distribution, and where the bottles were carefully washed before filling, the total bacterial content of two such bottles was 2,000 and 17,000 respectively; in another similar factory, where less care was taken, two bottles had a bacterial content of 2-3 million. Apart from the serious implications regarding the keeping qualities of food in establishments where such detergents are in everyday use, the question of their use in laboratory work should be re-examined.—F.E.W.

SENDRÓS, F. G. (1956). El "doping". [Doping in racehorses and in bullfighting.] — *Arch.*

permitted the inoculation, incubation and examination of 6 eggs without having to remove them from the rack.—R.M.

vet. Pract., Corunna. 5, No. 64. pp. Dop 1—Dop 5. (10 pp.)

1316

It was stated that stimulants commonly used in horse-racing were caffeine, strychnine, picrotoxin, cocaine and some of its derivatives, adrenaline, and especially the synthetic drugs, e.g. those of the amphetamine, sympathine and methamphetamine groups. For a circulatory stimulant leptazol (cardiazol) was used. Treated animals were given food rich in sugars to which alcoholic stimulants had been added. Testosterone and the adrenal cortex hormones had been tried, but were unreliable.

Drugs used for impairing an animal's performance were the sedatives, particularly chloral, the barbiturates, opiates (morphine), paraldehyde, bromides, camphor and strontium. For dogs paraldehyde and chlorpromazine were used. Sedatives with inconvenient side-effects were atropine, *Cannabis indica*, bulbocapnine, and the hydantoin derivatives. Apart from doping, other methods used for debilitating bulls were trimming and reshaping of the horns, intensive feeding, and administration of purgatives.—M.G.G.

BOOK REVIEWS

GOERTTLER, V. & KRÜGER, W. (1956). Rinder-tuberkulose—Hilf mit bei der Tilgung. [Bovine TB.—assist in its eradication.] pp. 40. Leipzig: S. Hirzel Verlag. DM 3.

1317

An attractively-presented brochure, suitable for the general public, explaining the danger of bovine tuberculosis for human beings and the need for, and methods of, eradicating it. It is produced by the Thüringia Animal Health Department and contains contributions from 8 specialists, e.g. Professor Dobberstein on the pathology of bovine tuberculosis, and Professor Ziegler on mammary tuberculosis. The financial aspect of losses from the disease, and the cost of eradication, are included. The numerous coloured diagrams and the 37 photographs are excellent. It serves as a model for other countries wishing to publicize tuberculosis eradication.

—R.M.

CILFON, C. E., RAFFEL, S. & STANIER, R. Y. [Edited by:] (1956). *Annual review of microbiology.* Volume 10. pp. vii + 426. Palo Alto, California: Annual Reviews, Inc. \$7.00.

1318

Reviews of veterinary interest in this volume are:—Bats, and their relation to rabies, by J. B. Enright; Pox viruses, by A. W. Downie & K. R. Dumbell; The anaerobic bacteria, with special reference to the genus *Clostridium*, by L. S. McClung; Review of the microbiological and immunological literature published in 1955 in the U.S.S.R., by P. Grabar; Factors affecting resistance to infection, by S. S. Elberg; Antimicrobial chemotherapy, by E. Jawetz; Antibodies as indicators for bacterial surface structures, by J. Tomcsik. Abstracts of the first four reviews are given elsewhere in this issue [see *V.B.* 27, 1036, 1070, 1091 & 1097.]—R.M.

LAPAGE, G. (1956). **Mönnig's veterinary helminthology and entomology.** pp. xv+511. London: Baillière, Tindall & Cox. 4th Edit. 42s. **1319**

Readers of this fourth edition will recognize that the text is essentially unchanged. There have been, however, some changes in the order in which the different sections are presented. In particular, the chapter on techniques and Dr. Mönnig's drawings of worm eggs have been moved to the end of the book and the references which formerly appeared as footnotes in the text have been collected together as a bibliography. Some new figures and a number of photographs from Thornton's "Text-book of Meat Inspection" have been added.

New material includes a new introduction and additions to the sections on treatment and control, but is concerned mainly with the general account of the Arthropoda and with details of classification, particularly of the Arthropoda.

This remains a useful text-book.
—S. BRIAN KENDALL.

STRAFFORD, N., STROUTS, C. R. N. & STUBBINGS, W. V. [Edited by.] (1956). **The determination of toxic substances in air. A manual of I.C.I. practice.** pp. xxvii+226. Cambridge: W. Heffer & Sons, Ltd. 35s. **1320**

The manual gives analytical methods for the determination of a wide range of toxic substances which may be found in the atmosphere of industrial chemical plants. The authors are to be congratulated on the diagrams of sampling apparatus and the clarity with which the various estimations are described. There is a wealth of practical detail, frequently absent from volumes of this kind, and safety precautions are stressed throughout.

Although the methods will not be directly applicable by workers in the veterinary field, some will undoubtedly be of value and interest to those concerned with atmospheric pollution and industrial contamination in relation to animal health.—G. LEWIS.

SCHEUNERT, A., BRÜGGERMANN, J., HORN, V. & HILL, H. (1957). Scheunert-Trautmann, Lehrbuch der Veterinär-Physiologie. [Scheunert-Trautmann's text-book of veterinary physiology.] pp. xii+580. Berlin (& Hamburg): Paul Parey. DM 58. **1321**

Trautmann, one of the original authors of this text-book, died in 1952. The present enlarged and revised edition, containing about 100 pages more than the previous one of 1951

[*V.B. 22, 633*], was published by collaboration of Scheunert, Brüggermann, Horn and Hill, professors of veterinary physiology at Berlin, Munich, Giessen and Hanover, respectively. The chapter on enzymes, vitamins and hormones has been completely recast. Among others, chapters on blood and circulation, locomotion, reproductive physiology and the autonomic nervous system have been extensively enlarged and in parts rewritten. Many illustrations have been added and substituted and total now 186. The subject index is adequate. Generally, the work is very well produced and although there are no bibliographical references it should fulfill its task in providing a sound text- and reference-book for veterinary students and all those interested in the physiology of domestic animals.

—E.G.

BOURNE, G. H. & DANIELLI, J. F. [Edited by.] (1956). **International review of cytology.** Volume V. pp. 570. London (& New York): Academic Books Ltd. \$11.50. **1322**

There are fourteen reviews in the 1956 volume. They describe histochemistry with labelled antibody, cell structure, enzyme adaptation in micro-organisms, mitochondria of muscle and of the neurone, deoxyribonucleic acid content of the nucleus, contractility of protoplasmic gel structure, intracellular pH, enzymes and the red cell, transfer of macromolecules, the pancreas and salivary glands, the acrosome reaction, and spermatogenesis.—M.G.G.

ROTHSCHILD. (1956). **Fertilization.** pp. ix+170. London: Methuen & Co. Ltd. 18s. **1323**

Original features of this work include a list of experiments which in the author's view ought to be done; an index of the plant and animal species mentioned in the text, and a refreshingly critical assessment of the value of many of the references appearing, in the list of over 500. In places an attractive dry humour appears, for example: "cell physiologists have often hoped, and sometimes persuaded themselves to believe that" . . . As might be expected from the author, the literature is assessed with scholarship and penetratingly discussed. Much of the work concerns the behaviour of sea-urchin germ cells, since so little is known about fertilization in other groups, but the chapter on polyspermy is one of immediate concern to the veterinary reader interested in farm animal breeding. The Russian claims are here discussed with a due degree of objectivity.

—F. L. M. DAWSON.

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